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Stargazing scientists at NASA are confident that when the next few decades humans will discover the very first signs of extraterrestrial life.

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00:00:09,000 --> 00:00:14,000

Yet some believe it's entirely possible alien craft have already visited Earth.

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00:00:17,000 --> 00:00:19,000

Large black flying object.

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00:00:19,000 --> 00:00:21,000

Hey calm down calm down.

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00:00:21,000 --> 00:00:25,000

But extraordinary claims demand extraordinary evidence.

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00:00:25,000 --> 00:00:33,000

In this series I'm going to investigate some of the most remarkable and recent UFO sightings from around the world.

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00:00:33,000 --> 00:00:36,000

They saw something really strange in the sky that day.

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00:00:37,000 --> 00:00:43,000

And I'll be joined by renowned astrophysicist and space journalist Sarah Cruders.

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00:00:43,000 --> 00:00:48,000

The thing is with something so extraordinary like this we've got to look at all the more logical explanations.

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00:00:48,000 --> 00:00:51,000

I still think this can be explained by science.

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00:00:52,000 --> 00:00:56,000

As together we'll separate back from fiction once and for all.

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00:00:56,000 --> 00:00:59,000

That is an unidentified flying object.

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00:00:59,000 --> 00:01:01,000

I knew you were going to say that and yes it is.

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00:01:01,000 --> 00:01:04,000

It's one of the greatest UFO mysteries of all time.

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00:01:04,000 --> 00:01:09,000

From our specially created UFO investigation hub we'll speak to experts.

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00:01:09,000 --> 00:01:14,000

We have no conventional explanation for what we are seeing here.

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00:01:14,000 --> 00:01:15,000

Whistleblowers.

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00:01:15,000 --> 00:01:21,000

Anytime you step out of ranks in an organization like mine there's obviously going to be some repercussions.

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00:01:21,000 --> 00:01:23,000

And first hand witnesses.

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00:01:23,000 --> 00:01:25,000

There was this massive boomerang.

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00:01:25,000 --> 00:01:28,000

It was at least a mile to a mile and a half wide.

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00:01:28,000 --> 00:01:29,000

It was huge.

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00:01:29,000 --> 00:01:32,000

Wow that's just spooked me now.

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00:01:32,000 --> 00:01:35,000

And finally answer the big question.

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00:01:36,000 --> 00:01:38,000

Are we alone in the universe?

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00:01:38,000 --> 00:01:41,000

Whatever they are they're not of this world.

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00:01:45,000 --> 00:01:50,000

The World

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00:01:54,000 --> 00:02:02,000

Four years ago the world was rocked by one of the most significant and compelling UFO sightings ever recorded.

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00:02:05,000 --> 00:02:09,000

A bizarre object was observed tumbling into our solar system.

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00:02:09,000 --> 00:02:14,000

Traveling at the blistering speed of 196,000 miles per hour.

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00:02:17,000 --> 00:02:21,000

The object named a Muamua came from the direction of Vega.

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00:02:21,000 --> 00:02:24,000

One of the brightest stars in the northern hemisphere.

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00:02:24,000 --> 00:02:28,000

On what some are convinced was a deliberate trajectory to Earth.

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00:02:29,000 --> 00:02:34,000

The World

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00:02:35,000 --> 00:02:43,000

Leading scientists have been left questioning whether this was our first official contact with an alien race.

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00:02:45,000 --> 00:02:48,000

We don't quite yet have the physics or mathematics to explain it.

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00:02:48,000 --> 00:02:50,000

Why is it speeding up?

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00:02:50,000 --> 00:02:52,000

It was definitely not a comet.

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00:02:52,000 --> 00:02:57,000

Potentially this object from 2017 was artificially in origin.

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00:02:57,000 --> 00:03:01,000

At that point we have to just hope that they are benevolent.

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00:03:04,000 --> 00:03:08,000

In October 2017 something strange approached Earth.

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00:03:08,000 --> 00:03:12,000

An object unlike anything humans had seen before.

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00:03:12,000 --> 00:03:19,000

This interloper from deep space was first spotted on the Pan-Stars telescope in Hawaii.

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00:03:20,000 --> 00:03:24,000

And subsequently confirmed by observatories around the world.

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00:03:24,000 --> 00:03:28,000

To be our very first visitor from interstellar space.

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00:03:28,000 --> 00:03:32,000

Its bizarre shape wasn't like anything seen before.

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00:03:32,000 --> 00:03:35,000

Flat, smooth, long and thin.

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00:03:35,000 --> 00:03:40,000

Around 800 meters in length and just 80 meters thick.

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00:03:40,000 --> 00:03:44,000

It surfaced 10 times more reflective than a typical comet.

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00:03:44,000 --> 00:03:50,000

A moua moua plunges into our solar system passing inside the orbits of Mercury.

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00:03:50,000 --> 00:03:54,000

A mere 23 million kilometers from Earth.

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00:03:54,000 --> 00:03:57,000

Far closer than any planet has ever come.

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00:03:57,000 --> 00:04:03,000

By the time the world's scientists and astronomers had trained their scopes onto the mysterious visitor.

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00:04:03,000 --> 00:04:05,000

It was leaving us again.

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00:04:05,000 --> 00:04:10,000

But what the cigar-shaped object did next defied all known understanding.

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00:04:10,000 --> 00:04:12,000

It accelerated.

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00:04:12,000 --> 00:04:15,000

As if something were pushing it on.

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00:04:15,000 --> 00:04:21,000

Astronomers and scientists have yet to find an explanation for the increase in velocity.

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00:04:21,000 --> 00:04:24,000

As it left our solar system.

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00:04:24,000 --> 00:04:30,000

Experts are unable to rule out the possibility it was an alien craft.

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00:04:30,000 --> 00:04:36,000

Making this surely the number one UFO sighting of all the other stars.

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00:04:36,000 --> 00:04:41,000

And in this investigation we're going to establish once and for all.

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00:04:41,000 --> 00:04:46,000

Was a moua moua just a rock or an alien rocket?

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00:04:56,000 --> 00:05:03,000

So, Sarah, people observed this strange cigar-shaped object entering our solar system.

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00:05:03,000 --> 00:05:07,000

They called it a moua moua. People got really excited.

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00:05:07,000 --> 00:05:11,000

They thought it was a sign of extraterrestrial life.

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00:05:11,000 --> 00:05:12,000

Were they right?

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00:05:12,000 --> 00:05:16,000

Is the extraterrestrial intelligence outside there in the universe?

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00:05:16,000 --> 00:05:17,000

That is the big question.

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00:05:17,000 --> 00:05:23,000

I mean, a moua moua, it was discovered by a telescope in Hawaii and it actually means the name messenger.

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00:05:23,000 --> 00:05:24,000

First messenger.

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00:05:24,000 --> 00:05:28,000

Some scientists have come up with the hypothesis that this could potentially be an alien spacecraft

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00:05:28,000 --> 00:05:34,000

because if it's very long cigar shape it wasn't what we expected an object outside of our solar system to look like.

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00:05:34,000 --> 00:05:37,000

We don't know whether there's more intelligent civilisations out there.

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00:05:37,000 --> 00:05:43,000

Do people think it was a spaceship because it resembled Stanley Kubrick's spaceship in 2001, a space odyssey?

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00:05:43,000 --> 00:05:46,000

Well, kind of, but it's because we expected it to be round.

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00:05:46,000 --> 00:05:52,000

That goes with all the current laws of physics for how solar systems form, bodies in space form.

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00:05:52,000 --> 00:05:57,000

So it was an unusual shape and also it was accelerating which we didn't know.

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00:05:57,000 --> 00:05:59,000

So the show signs are being powered then?

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00:05:59,000 --> 00:06:00,000

We don't know.

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00:06:00,000 --> 00:06:05,000

We don't know, but it's certainly interesting and the question of are we alone is a huge scientific question.

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00:06:05,000 --> 00:06:07,000

It's the age old question.

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00:06:07,000 --> 00:06:08,000

How do we establish it?

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00:06:08,000 --> 00:06:10,000

I've got someone we can speak to about this.

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00:06:10,000 --> 00:06:12,000

His name is Seth Shostak.

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He's an astronomer at the SETI Institute.

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00:06:15,000 --> 00:06:17,000

Hi Seth, Craig and Sarah here.

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00:06:17,000 --> 00:06:18,000

Hi.

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00:06:18,000 --> 00:06:24,000

Dr Seth Shostak is a highly respected senior astronomer at the SETI Institute,

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00:06:24,000 --> 00:06:31,000

which stands for the Search for Extraterrestrial Intelligence and is an agency established by NASA,

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00:06:31,000 --> 00:06:39,000

dedicated to investigating the nature of the universe and understanding the prevalence of life beyond Earth.

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00:06:39,000 --> 00:06:42,000

So what is the significance of the moon?

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00:06:42,000 --> 00:06:47,000

Because I mean people have postulated that it might be an alien craft.

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00:06:47,000 --> 00:06:53,000

They have and some of the people that have done that are actually, you know, they're very qualified people.

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00:06:53,000 --> 00:06:55,000

I mean Avi Loeb of Harvard.

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00:06:55,000 --> 00:06:56,000

He's a very qualified guy.

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00:06:56,000 --> 00:06:57,000

He's a very smart guy.

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00:06:57,000 --> 00:06:59,000

And he's also a brave guy.

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00:06:59,000 --> 00:07:05,000

He would step up and say, look, one explanation you're just ruling out right from the beginning is that it's a spacecraft.

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00:07:05,000 --> 00:07:12,000

But it doesn't really have any behavior that's so consistent with what you'd expect from a spacecraft,

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00:07:12,000 --> 00:07:15,000

vis-a-vis just an ordinary rock and asteroid.

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00:07:15,000 --> 00:07:20,000

But on the other hand, would you see something that you don't quite understand in the universe?

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00:07:20,000 --> 00:07:28,000

It's not a bad thing to at least consider that it might be alien activity because otherwise you throw out the baby with the bath water.

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00:07:28,000 --> 00:07:31,000

Did the shape of it surprise you in any way?

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00:07:31,000 --> 00:07:34,000

Well, I mean it does have this very elongated shape.

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00:07:34,000 --> 00:07:43,000

Many, many people have seen this artist's rendition, which makes, you know, a moon will look like a kind of a bumpy cigar in space.

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00:07:43,000 --> 00:07:45,000

But actually we don't know that it looks anything like that.

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00:07:45,000 --> 00:07:47,000

All we know is it's longer than it is wide.

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00:07:47,000 --> 00:07:48,000

That's what we know.

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00:07:48,000 --> 00:07:55,000

Anything that has traveled, you know, so many light years over, who knows, maybe even millions of years, right?

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00:07:55,000 --> 00:08:03,000

The stream of particles that it goes through would likely, you know, sort of turn it into a streamlined shape.

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00:08:03,000 --> 00:08:07,000

Just could be a result of simply its travels through space.

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00:08:07,000 --> 00:08:14,000

But there is a potential there, just a small chance that this is an alien spacecraft perhaps visiting somewhere else in our solar system.

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00:08:14,000 --> 00:08:16,000

Yeah, it's possible.

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00:08:16,000 --> 00:08:24,000

The best argument was made that this is something that was deliberately sent our way is the very fact that it got into our solar system.

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00:08:24,000 --> 00:08:30,000

You know, it's like saying, ah, well, all right, I'm going to put a coin, say, 100 feet away on the sidewalk here,

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00:08:30,000 --> 00:08:37,000

and I'm just going to throw a tennis ball up into the air and it's going to hit that coin, you know, by chance to come that close.

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00:08:37,000 --> 00:08:39,000

It's just not so likely.

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00:08:39,000 --> 00:08:44,000

Do you think that extraterrestrial life exists in our universe?

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00:08:44,000 --> 00:08:46,000

There's a lot of real estate out there, right?

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00:08:46,000 --> 00:08:53,000

There are like a trillion, trillion, with a D, planets and moons in our galaxy alone.

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00:08:53,000 --> 00:08:56,000

So if we are alone, well, that's remarkable.

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00:08:56,000 --> 00:09:02,000

You can sleep better at night because that means that we are, in fact, a miracle.

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00:09:02,000 --> 00:09:08,000

How do we work out the probability of there being intelligent life on any of these planets?

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00:09:08,000 --> 00:09:15,000

Well, you can use the Drake equation to kind of estimate how many intelligent civilizations are out there.

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00:09:15,000 --> 00:09:18,000

I give you a million Earths, right?

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00:09:18,000 --> 00:09:20,000

Well, what fraction of them will cook up life?

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00:09:20,000 --> 00:09:23,000

How many of them will cook up life with a brain?

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00:09:23,000 --> 00:09:28,000

And how many of those with a brain will get into a position where they could potentially come here in their saucers?

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00:09:28,000 --> 00:09:34,000

So you haven't got a date where you think that they'll arrive because I just want to make sure because I want to be in?

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00:09:34,000 --> 00:09:38,000

You want to be in? But I'll buy you all a cup of coffee, a flat white.

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00:09:38,000 --> 00:09:47,000

If we don't find DT by 2035 or some date like that, by that time we will have looked at at least a million star systems

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00:09:47,000 --> 00:09:50,000

compared to only a few thousand as of the moment.

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00:09:50,000 --> 00:09:52,000

So chances of finding something go way up.

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00:09:52,000 --> 00:09:53,000

Thank you so much, Seth.

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00:09:53,000 --> 00:09:55,000

Well, it's been my pleasure.

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00:09:55,000 --> 00:09:57,000

How do you feel about that? Science, come on.

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00:09:57,000 --> 00:09:59,000

One thing he said kind of went over my head.

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00:09:59,000 --> 00:10:00,000

Which?

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00:10:00,000 --> 00:10:01,000

Well, several things really.

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00:10:01,000 --> 00:10:03,000

But what is the Drake equation?

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00:10:03,000 --> 00:10:06,000

Well, the Drake equation is basically an equation. You can see it there.

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00:10:06,000 --> 00:10:11,000

It's just a way of finding out or estimating how many intelligent civilizations exist in the universe.

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00:10:11,000 --> 00:10:13,000

We don't know, but this is a good estimate.

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00:10:13,000 --> 00:10:18,000

So basically it looks at the rate of star formation, the number of stars which might have planets,

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00:10:18,000 --> 00:10:21,000

and then the number of those stars with planets where life could exist,

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00:10:21,000 --> 00:10:23,000

which might be in the so-called Goldilocks zone.

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00:10:23,000 --> 00:10:26,000

So that's where it's not too hot, not too cold, just right for life to exist.

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00:10:26,000 --> 00:10:27,000

Are you with me still?

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00:10:27,000 --> 00:10:28,000

I'm still with you.

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00:10:28,000 --> 00:10:33,000

So it's hugely complex, but actually if you even put in the lowest numbers,

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00:10:33,000 --> 00:10:38,000

you still get an answer that we're not the only intelligent civilization in the universe.

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00:10:40,000 --> 00:10:45,000

If you can handle the eye-watering numbers, so glad I paid attention at school,

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00:10:45,000 --> 00:10:53,000

and work this equation designed to estimate the odds of finding intelligent extraterrestrial life to its conclusion,

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00:10:54,000 --> 00:11:01,000

then the answer is there are probably between a thousand and a hundred million planets in our Milky Way alone

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00:11:01,000 --> 00:11:04,000

that have developed complex civilizations.

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00:11:11,000 --> 00:11:16,000

The big question is how many of those intelligent life forms can build spaceships?

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00:11:16,000 --> 00:11:18,000

Well, that's actually a great question.

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00:11:18,000 --> 00:11:23,000

Do alien civilizations only get so far, and then they kill each other, destroy themselves?

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00:11:23,000 --> 00:11:24,000

We don't know.

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00:11:24,000 --> 00:11:26,000

It's a sobering thought, though.

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00:11:29,000 --> 00:11:33,000

But let's assume one alien civilization did survive,

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00:11:33,000 --> 00:11:37,000

and a Muammua is evidence of their existence.

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00:11:37,000 --> 00:11:41,000

We have to get to the truth about what this extraordinary object really is.

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00:11:44,000 --> 00:11:45,000

Coming up.

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00:11:45,000 --> 00:11:48,000

Do you think there's a potential that alien civilizations are watching us?

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00:11:48,000 --> 00:11:50,000

Yes, completely.

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00:11:50,000 --> 00:11:57,000

XMOD official Nick Pope believes Ayrth could have been a Muammua's intended destination.

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00:11:57,000 --> 00:12:01,000

If they're out there, they've probably found us already.

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00:12:01,000 --> 00:12:06,000

While Sarah's convinced alien life is already very close to home.

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00:12:06,000 --> 00:12:12,000

Jupiter has got this moon called Europa, and there could potentially be some sort of alien fish like that.

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00:12:12,000 --> 00:12:14,000

They're just getting really interested.

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00:12:16,000 --> 00:12:24,000

In this investigation, we're looking at one of the greatest and seismically important UFO sightings in human history.

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00:12:25,000 --> 00:12:31,000

It may force us to come to terms with a profound realization that we are not alone.

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00:12:35,000 --> 00:12:42,000

On the 19th of October 2017, the very first known interstellar object was observed

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00:12:42,000 --> 00:12:46,000

to have passed through our solar system at hyperbolic speed.

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00:12:47,000 --> 00:12:56,000

Cigar shaped and elongated, 800 meters in length, and ten times longer than it was wide, tumbling end over end.

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00:12:56,000 --> 00:12:59,000

The missile was named a Muammua.

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00:12:59,000 --> 00:13:06,000

The object passed within 23 million kilometers of Earth, which in galactic terms is a flyby.

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00:13:07,000 --> 00:13:11,000

As well as speculation on what it was and where it could have come from,

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00:13:11,000 --> 00:13:21,000

the unexpected appearance of such a massive projectile was a reminder of how vulnerable we are to a potential interstellar impact or event.

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00:13:23,000 --> 00:13:37,000

On the 30th of June 1908, the largest asteroid impacting recorded history flattened over 2,000 square kilometers of remote Siberian forest.

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00:13:38,000 --> 00:13:45,000

The Tunguska event released a thousand times more energy than the atomic bomb dropped on Hiroshima.

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00:13:46,000 --> 00:13:50,000

But whether a Muammua was a rock at all is up for debate.

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00:13:51,000 --> 00:13:57,000

Its bizarre shape and trajectory has left scientists considering a world-rocking possibility.

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00:14:00,000 --> 00:14:04,000

People have postulated that it might be an alien craft.

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00:14:04,000 --> 00:14:10,000

It might indeed be something deliberate, something directed by alien intelligence if you like.

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00:14:11,000 --> 00:14:19,000

What has really grabbed the expert's attention is that as a Muammua turned and headed back into deep space, it accelerated.

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00:14:22,000 --> 00:14:29,000

One possibility is that it was a comet, which unlike an asteroid, is an icy dusty object,

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00:14:29,000 --> 00:14:38,000

which would typically eject vapor in the form of a coma or tail as it passes closer to the sun, which would explain the increase in speed.

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00:14:39,000 --> 00:14:41,000

But a Muammua had no tail.

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00:14:44,000 --> 00:14:51,000

We know this object was extraterrestrial because it didn't come from our solar system, but was it under alien control?

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00:14:52,000 --> 00:14:55,000

We don't know, but we're on a mission to find out.

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00:15:00,000 --> 00:15:03,000

Sarah, we're talking about a Muammua.

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00:15:04,000 --> 00:15:09,000

We are barely beginning to scratch the surface. With a Muammua, we know that it is dividing some scientists' opinion.

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00:15:10,000 --> 00:15:11,000

So who thinks it's an alien craft?

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00:15:12,000 --> 00:15:15,000

Well, a few people do. The most prominent is a Harvard scientist called R.V. Lowe.

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00:15:16,000 --> 00:15:20,000

He says there is the potential that this could be an alien spacecraft.

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00:15:21,000 --> 00:15:27,000

It looked very weird, unlike any comet or asteroid that we have seen before from within the solar system.

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00:15:27,000 --> 00:15:36,000

It was ten times longer than it is wide, and also it exhibited a push away from the sun without showing any cometary tail.

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00:15:37,000 --> 00:15:39,000

So it was definitely not a comet.

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00:15:40,000 --> 00:15:51,000

Potentially, this object was artificially in origin and therefore potentially a message in a bottle telling us that we are not alone and perhaps not the smartest kid on the block.

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00:15:52,000 --> 00:15:57,000

One thing that fascinates me about a Muammua is that it's dividing scientific opinion.

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00:15:58,000 --> 00:16:00,000

And one thing that they're all divided about is its shape.

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00:16:01,000 --> 00:16:07,000

Yeah, the shape's really unusual. It's not what we expected, although we don't know what to expect. The shape is exciting.

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00:16:08,000 --> 00:16:10,000

And you talked to Nick Pope about this, didn't you?

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00:16:11,000 --> 00:16:17,000

Yes, that's right. Nick Pope, former M.O.D. investigator and UFO expert, and not surprisingly, he had a lot to say about this.

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00:16:18,000 --> 00:16:28,000

So Nick, one of the most significant sightings that we've had ever is a Muammua, which is the first interstellar object which has ever been detected in our solar system.

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00:16:29,000 --> 00:16:37,000

And what kind of stumped scientist is its shape? We expected it to be spherical and to behave in certain ways, but what's your take on this, Nick?

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00:16:37,000 --> 00:16:55,000

Well, I'm not a scientist, but when a Harvard astronomer says, I think there are a number of characteristics about this object that mean it may be not just interstellar, but actually artificial in origin, he gets my attention for sure.

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00:16:56,000 --> 00:17:06,000

We know it's interstellar because it's travelling much faster. And it's completely dom-founded, many scientists, but what they've actually detected is that it's sped up as well as it's travelled through our solar system.

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00:17:07,000 --> 00:17:13,000

And we can't explain what this is. Does this concern you, Nick? Does this worry you?

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00:17:14,000 --> 00:17:24,000

It interests me. And again, I go back to what Avi Loeb said about a number of characteristics that

he said pointed to artificial origin.

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00:17:25,000 --> 00:17:33,000

I think he mentioned, for example, that he thought that the acceleration could not be explained by gravitational forces alone.

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00:17:33,000 --> 00:17:44,000

I mean, when somebody of that calibre says, I think this thing could be, could be, you know, an extraterrestrial spacecraft, we should listen and we should test it.

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00:17:45,000 --> 00:17:58,000

I mean, a few years ago, speculation like this would have been laughed out of court. The fact that we are now having a serious scientific debate about this, I think it's a sign of, my goodness, how the times have changed over the last few years.

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00:17:58,000 --> 00:18:07,000

One thing which is significant when we look at humans exploring space is that if we want to go further, we're limited by the speeds that we can travel at.

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00:18:07,000 --> 00:18:20,000

We haven't got the propulsion systems to enable us to travel incredibly fast. So if we were to go and develop the technology, we would actually need spacecraft, which are 100, perhaps even a thousand years, and you'd have generations on those spacecraft.

219

00:18:21,000 --> 00:18:30,000

Do you think there's a potential that that's something an alien civilization would do and this could potentially be a generational spacecraft from another civilization?

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00:18:30,000 --> 00:18:37,000

Yes, some people have speculated that it could be some sort of generational spacecraft, or maybe it's unmanned.

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00:18:37,000 --> 00:18:55,000

Maybe it's a derelict ship just drifting through the cosmos and it only activates itself when it comes into proximity of a solar system. This is all speculation, I admit, but it's all we can do.

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00:18:55,000 --> 00:19:02,000

In your opinion, do you think there's a potential that alien civilizations know about us and they're watching us?

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00:19:02,000 --> 00:19:15,000

Yes, completely. It only takes a civilization with perhaps a few tens of years, they'll own hundreds, thousands, millions, that absolutely they would be aware of us.

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00:19:15,000 --> 00:19:28,000

It only takes a civilization with a bit more technology than us to probably spot us from halfway across the galaxy. So if they're out there, they've probably found us already.

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00:19:32,000 --> 00:19:37,000

Well, being the only intelligent lifeform on this show, what do you think of that?

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00:19:37,000 --> 00:19:46,000

I think it blows my mind. I think we know so little and it's frustrating because you always want to go a thousand years in the future and find out what we eventually know and we are.

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00:19:46,000 --> 00:19:52,000

We're stuck here, we don't live long enough. Obviously at the moment we know the limit that you can travel at is the speed of light.

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00:19:52,000 --> 00:20:02,000

There's so much we don't know, it's so frustrating, but it's also concerning the fact that we look at history and when civilizations have met, they've generally clashed.

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00:20:02,000 --> 00:20:08,000

Why do we think it would be any different in space? Why do we think alien civilizations would be any different?

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00:20:08,000 --> 00:20:20,000

Nick thinks we're close to finding them. Would the universe being so, well, infinite, what are the

chances really? Because it's too big?

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00:20:20,000 --> 00:20:25,000

We don't know, there could be like, look at microbial life, we could find microbial life on Mars.

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00:20:25,000 --> 00:20:30,000

Yeah, but microbes are boring. Microbes are boring. Okay, I'll give you something more exciting. Okay. Fish.

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00:20:30,000 --> 00:20:35,000

Oh! So, are you excited? A bit more.

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00:20:35,000 --> 00:20:40,000

Jupiter has got this moon called Europa and Saturn has got this moon called Intellitus.

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00:20:40,000 --> 00:20:49,000

They've got lots of other moons, but these two moons are very exciting. Europa has got an icy surface and beneath it, it's highly likely to have a liquid ocean.

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00:20:50,000 --> 00:20:57,000

There is the raw ingredients there for life in this ocean of this moon and there could potentially

be some sort of alien fish life there.

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00:20:57,000 --> 00:21:02,000

We just don't know, we're about to send spacecraft there to begin the process of finding out.

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00:21:02,000 --> 00:21:04,000

They're just getting really interested.

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00:21:04,000 --> 00:21:11,000

Coming up. What do you think that the first aliens might not be biological beings, but perhaps robotic?

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00:21:11,000 --> 00:21:19,000

Astrobiologists Dr. Natalie Cabrol adds fuel to the theory that a Muamua was an unmanned alien craft.

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00:21:19,000 --> 00:21:24,000

Machines and robots are likely to be the first thing that we encounter.

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00:21:24,000 --> 00:21:29,000

And the sheer scale of this investigation pushes me to my limits.

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00:21:29,000 --> 00:21:31,000

That's what twists my melon.

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00:21:31,000 --> 00:21:36,000

It's because the numbers are so big, it's almost impossible to imagine.

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00:21:39,000 --> 00:21:47,000

Are we alone in the universe? Or somewhere out there, our intelligent beings staring into the night sky and asking the same question?

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00:21:48,000 --> 00:21:53,000

There's little doubt in the scientific community that life does exist beyond our solar system.

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00:21:53,000 --> 00:22:02,000

And with worlds shaking advances and how we search the depths of space, we may well be approaching the point of first contact.

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00:22:02,000 --> 00:22:07,000

But some scientists believe that point has already been reached.

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00:22:07,000 --> 00:22:15,000

When a Muamua, the mysterious interloper from deep space arrived in our solar system in 2017.

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00:22:16,000 --> 00:22:26,000

Potentially, this object was artificially in origin and therefore potentially a message in a bottle telling us that we are not alone.

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00:22:26,000 --> 00:22:38,000

Professor Loeb believed the peculiar features of a Muamua suggest it could be an alien probe sent to our solar system intentionally by an extraterrestrial civilization.

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00:22:38,000 --> 00:22:41,000

But there are other theories too.

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00:22:41,000 --> 00:22:50,000

Some people have speculated that it could be some sort of generational spacecraft or maybe it's a derelict ship just drifting through the cosmos.

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00:22:50,000 --> 00:22:59,000

And it only activates itself when it comes into proximity of a solar system.

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00:22:59,000 --> 00:23:09,000

The appearance of this remarkable object has divided the scientific community, with some convinced a Muamua was less rocket and more rock.

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00:23:09,000 --> 00:23:19,000

But it doesn't really have any behavior that's so consistent with what you'd expect from a spacecraft vis-a-vis just an ordinary rock and asteroid.

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00:23:19,000 --> 00:23:29,000

What is certain is this extraordinary investigation is forcing us to ask the really big question, are we alone in the universe?

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00:23:30,000 --> 00:23:39,000

Okay, so Sarah has been trying to find out whether a Muamua is a rock or a rocky.

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00:23:39,000 --> 00:23:49,000

We've been trying to find out if we are the most intelligent life form in the cosmos, in fact the only intelligent life.

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00:23:49,000 --> 00:23:55,000

We could be completely alone in this vast universe or there could be loads of life out there, we just don't know.

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00:23:55,000 --> 00:24:02,000

I mean the universe is so big it's like trying to find a needle in a haystack that's a billion, billion, billion miles long.

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00:24:03,000 --> 00:24:13,000

The next step in our investigation is to take a closer look at the red planet, Mars, where the search for life is at full throttle.

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00:24:13,000 --> 00:24:17,000

And we have some of the latest photographic images here in the hub.

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00:24:17,000 --> 00:24:24,000

First of all that is Mars, that's been taken by the Perseverance rover, that's NASA's most recent rover to land on the red planet.

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00:24:24,000 --> 00:24:33,000

We are hunting for signs of ancient microbial life on Mars, so this vast barren, dusty landscape might have once had very simple life.

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00:24:33,000 --> 00:24:40,000

And if that life that we find on Mars isn't related to life on Earth, that means in our average

solar system,

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00:24:40,000 --> 00:24:47,000

two genesis is within our one average solar system, two worlds, which both have life forming independently of each other.

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00:24:47,000 --> 00:24:54,000

So by finding microbial life on Mars, it helps us answer the question as to is there intelligent life out there.

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00:24:56,000 --> 00:25:03,000

So, if I'm understanding this correctly, if ancient signs of microbial life are discovered on Mars,

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00:25:03,000 --> 00:25:09,000

it will confirm that basic forms of life in the right conditions could evolve anywhere in the universe.

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00:25:10,000 --> 00:25:16,000

What I want to know is how likely is it we'll find intelligent life?

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00:25:16,000 --> 00:25:23,000

Because if a Muah-Muah is an alien ship, I'd hazard a guess, it's not being piloted by microbes.

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00:25:23,000 --> 00:25:25,000

OK, so where are you going to take me now?

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00:25:25,000 --> 00:25:31,000

Well, we're going to speak to an astrobiologist, her name is Natalie Cabral and she's from the SETI Institute.

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00:25:31,000 --> 00:25:33,000

Hi Natalie, it's Craig and Sarah here.

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00:25:33,000 --> 00:25:35,000

Hi.

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00:25:36,000 --> 00:25:44,000

As well as being involved in the hunt for life on Mars, Dr. Natalie Cabral is also an explorer of extreme environments

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00:25:44,000 --> 00:25:51,000

and has one mission to learn where we might find extraterrestrial life and what it will look like.

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00:25:51,000 --> 00:25:55,000

With the universe being so big, how difficult is your job at SETI?

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00:25:55,000 --> 00:25:59,000

There are more planets than stars in our galaxy.

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00:25:59,000 --> 00:26:04,000

We probably have 400 billion planets in our galaxy.

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00:26:04,000 --> 00:26:10,000

So I would say that on and on there are probably a lot of intelligent life out there.

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00:26:10,000 --> 00:26:15,000

What are the chances that intelligent life has already reached this planet?

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00:26:15,000 --> 00:26:17,000

This is my biggest wish.

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00:26:17,000 --> 00:26:22,000

I wish so much that I could tell you today, yes, we already made contact.

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00:26:22,000 --> 00:26:27,000

But I would caution people just to keep a simple logic.

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00:26:27,000 --> 00:26:36,000

If you feel that an intelligent species has covered the billions of kilometers or light years to come and visit us,

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00:26:36,000 --> 00:26:45,000

I doubt that it would be just to stack a pile of stone on top of each other or just to draw crop circles.

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00:26:45,000 --> 00:26:50,000

Is it likely that it will ever happen in the next few decades, say?

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00:26:50,000 --> 00:26:55,000

We are closer than we ever were and we are at the beginning of it.

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00:26:55,000 --> 00:27:00,000

So it may be that there are other intelligent species out there that are way more advanced than we are,

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00:27:00,000 --> 00:27:05,000

that know things that we don't and it may be that for them distances are not an issue.

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00:27:05,000 --> 00:27:14,000

I mean, is there not a danger that an alien life force coming here, there's been war and disease and famine on their planet

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00:27:14,000 --> 00:27:17,000

and they're trying to find somewhere else to call home?

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00:27:17,000 --> 00:27:20,000

Like we would want to leave this planet because we've wrecked it.

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00:27:20,000 --> 00:27:31,000

If aliens are coming because they're escaping these kind of problems, there are a couple of possibilities.

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00:27:31,000 --> 00:27:39,000

First, if they land here, obviously they know a lot more in terms of propulsion and space travel than we do.

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00:27:39,000 --> 00:27:43,000

So they are likely more advanced than we are.

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00:27:43,000 --> 00:27:47,000

So at that point, we have to just hope that they are benevolent.

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00:27:47,000 --> 00:27:55,000

Looking at the extremes that we know life can survive on and what we know about how diverse life is,

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00:27:55,000 --> 00:27:59,000

can we speculate as to what aliens might look like?

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00:27:59,000 --> 00:28:01,000

Ah, that's a good question.

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00:28:01,000 --> 00:28:05,000

So, depends what type of aliens you are talking about.

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00:28:05,000 --> 00:28:08,000

Are you talking about micro-ET or grown-up ET?

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00:28:08,000 --> 00:28:11,000

Grown-up ET, let's get the bad boy.

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00:28:11,000 --> 00:28:13,000

The bad boys first.

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00:28:13,000 --> 00:28:17,000

Each world is a unique planetary experiment.

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00:28:17,000 --> 00:28:24,000

So depending on your environment, you are going to develop a number of characteristics to interact with your environment.

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00:28:24,000 --> 00:28:36,000

So you can expect that aliens will have either a brain or a neural box that gives them the possibility to interact with the outside

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00:28:36,000 --> 00:28:42,000

and they will have eyes or cameras or something that allows them to see, to touch, etc.

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00:28:42,000 --> 00:28:44,000

So you can go wild.

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00:28:44,000 --> 00:28:51,000

What do you think the potential that the first aliens might not be biological beings but perhaps robotic?

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00:28:51,000 --> 00:29:02,000

I think that it makes a lot of sense for an advanced civilization to be a machinery that's capable of reproducing itself and spread across space.

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00:29:02,000 --> 00:29:11,000

So, but definitely machines and robots are likely to be the first thing that we encounter, I would say.

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00:29:13,000 --> 00:29:15,000

Wow, there you have it.

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00:29:15,000 --> 00:29:22,000

Dr. Natalie Cabraud believes the first alien encounter is likely to be with a machine.

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00:29:23,000 --> 00:29:26,000

Could that machine be a moua moua?

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00:29:26,000 --> 00:29:30,000

The truth is out there, but can we find it?

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00:29:30,000 --> 00:29:36,000

The sheer scale of this deep space investigation is testing me in ways I'd never imagined.

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00:29:36,000 --> 00:29:40,000

That's what twists my melon when we start doing stuff like this.

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00:29:40,000 --> 00:29:45,000

It's because the numbers are so big it's almost impossible to imagine.

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00:29:45,000 --> 00:29:48,000

Yeah, the universe is a stranger and you can imagine.

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00:29:48,000 --> 00:29:52,000

It just blows my mind all the possibilities that could potentially be out there.

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00:29:52,000 --> 00:29:57,000

One of Harvard's top astronomers actually believes this could potentially be an interstellar spaceship.

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00:29:57,000 --> 00:30:02,000

It could almost be like a boiler notion that an alien civilization has sent out.

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00:30:02,000 --> 00:30:04,000

It's not acting like anything we've ever seen before because it's actually speeding up.

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00:30:04,000 --> 00:30:09,000

Yeah, and that's really unusual and it shapes so unusual because we know there are objects beyond our solar system.

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00:30:09,000 --> 00:30:12,000

We know at some point they're going to pass through our solar system.

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00:30:12,000 --> 00:30:16,000

We never expected these objects to look like this, so it's hugely surprising.

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00:30:17,000 --> 00:30:23,000

The deeper we delve into this extraordinary case, the more perplexing and frustrating it becomes.

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00:30:23,000 --> 00:30:32,000

What is without doubt and unanimously agreed by the scientific community is that a moua moua had highly unusual properties.

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00:30:34,000 --> 00:30:36,000

It's bizarre elongated shape.

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00:30:36,000 --> 00:30:44,000

It's inexplicable non-gravitational acceleration and the fact it entered our solar system at all.

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00:30:46,000 --> 00:30:51,000

To try and find out more, we need to speak to the CEO of Zeti, Bill Diamond.

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00:30:52,000 --> 00:30:54,000

Hi Bill, Craig and Sarah here.

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00:30:54,000 --> 00:30:55,000

Hello Craig and Sarah, how are you?

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00:30:55,000 --> 00:30:57,000

This is me and Sarah, we're just talking about a moua moua.

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00:30:57,000 --> 00:31:00,000

What is the significance of a moua?

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00:31:00,000 --> 00:31:08,000

It's certainly an interesting object and has garnered a lot of attention thanks in no small part to Abilow at Harvard.

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00:31:08,000 --> 00:31:17,000

But although it had a seemingly an interesting sort of shape from what we can tell from literally one pixel worth of image data,

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00:31:17,000 --> 00:31:27,000

but we could look at how that pixel changed in its brightness and we could also track its speed and its vector and direction of travel.

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Why do you think that some scientists have said this has got the potential to be an alien spaceship?

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00:31:33,000 --> 00:31:43,000

I think the reason is that we expect certain phenomena that we observe to behave in certain ways that we can attribute to natural forces or phenomena.

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00:31:43,000 --> 00:31:47,000

And when they don't, of course it gives rise to question, well why didn't this?

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00:31:47,000 --> 00:31:57,000

If in fact this object was traveling with some characteristics that we felt were not what one would expect of a comet for example,

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00:31:57,000 --> 00:32:01,000

why did this object seem to accelerate after it went around the sun?

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00:32:01,000 --> 00:32:11,000

Even though it wasn't sort of a blading material which would act like a jet engine, pushing material up an object tends to push the object in the opposite direction.

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00:32:11,000 --> 00:32:12,000

Why is it speeding up?

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00:32:12,000 --> 00:32:19,000

Could one explanation be that this was in fact something mechanical or technological rather than something natural?

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00:32:20,000 --> 00:32:26,000

Coming up, Bill Diamond is convinced that intelligent alien life is out there.

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00:32:26,000 --> 00:32:35,000

It stands to reason that in other places life has had the chance to evolve into intelligence, certainly, and technology perhaps.

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00:32:35,000 --> 00:32:39,000

Wow. And we close in on a final verdict.

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00:32:39,000 --> 00:32:43,000

Amua Mua. Is it a rock or is it a rocket?

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00:32:46,000 --> 00:32:57,000

We're on a mission to uncover the truth about whether Amua Mua, the mysterious object that was observed leaving our solar system on the 19th of October 2017,

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00:32:57,000 --> 00:33:01,000

was sent intentionally by an alien civilization.

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00:33:02,000 --> 00:33:13,000

When a Harvard astronomer says, I think there are a number of characteristics about this object that mean it may be not just interstellar,

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00:33:13,000 --> 00:33:19,000

but actually artificial in origin, he gets my attention for sure.

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00:33:19,000 --> 00:33:25,000

But over the course of our investigation, we've also had to confront the biggest question of all.

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00:33:26,000 --> 00:33:34,000

Are we alone in the universe? And some leading scientists we've spoken to are convinced we aren't.

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00:33:34,000 --> 00:33:41,000

There are more planets than stars in our galaxy. We probably have 400 billion.

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00:33:41,000 --> 00:33:45,000

So I would say that there are probably a lot of intelligent life out there.

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00:33:45,000 --> 00:33:53,000

If we are alone, well, that's remarkable. You can sleep better at night because that means that we are in fact a miracle.

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00:33:55,000 --> 00:34:04,000

If intelligent life is out there, then that further raises the possibility that Amua Mua was sent to our solar system on purpose.

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00:34:07,000 --> 00:34:13,000

We're speaking to Bill Diamond, the CEO of SETI, the search for extraterrestrial intelligence,

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00:34:13,000 --> 00:34:21,000

who has serious questions around why Amua Mua was observed to perform an inexplicable acceleration.

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00:34:21,000 --> 00:34:28,000

Well, why did this object seem to accelerate after it went around the sun, even though it wasn't sort of ablating the material,

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00:34:28,000 --> 00:34:31,000

which would act like a jet engine? Why is it speeding up?

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00:34:31,000 --> 00:34:38,000

Could one explanation be that this was in fact something mechanical or technological rather than something natural?

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00:34:40,000 --> 00:34:45,000

Or the other alternative is, you know, there's something natural, but, you know, not something we've observed before,

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00:34:45,000 --> 00:34:49,000

so we don't quite yet have the physics or mathematics to explain it.

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00:34:49,000 --> 00:34:57,000

Bill, the search for extraterrestrial intelligence is like trying to find a needle in a billion-billion haystacks.

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00:34:57,000 --> 00:35:01,000

Doesn't it become quite frustrating to do what you do?

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00:35:03,000 --> 00:35:11,000

Well, not really. I mean, I think even the search for life in its most basic forms and perhaps quite nearby,

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00:35:11,000 --> 00:35:13,000

the discovery would be profound in the extreme.

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00:35:13,000 --> 00:35:23,000

If life is a common phenomena, it stands to reason that at least in some other places life has had the chance to evolve into intelligence,

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00:35:23,000 --> 00:35:32,000

certainly, and technology perhaps. And while it is a bit of a needle in a haystack for sure, at least we know where in the haystack to look.

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00:35:32,000 --> 00:35:41,000

We actually know which planets are sort of Earth-like, so now we can actually identify targets that are more interesting to look at more closely.

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00:35:42,000 --> 00:35:45,000

Are we the most intelligent civilization in the universe?

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00:35:45,000 --> 00:35:52,000

Is it really likely that, you know, Earth is the only place in our own galaxy where life has evolved and where intelligence has evolved?

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00:35:52,000 --> 00:36:00,000

Doubt it. Very sincerely. But bear in mind that if we took the fastest spacecraft that humans have ever built and we sent it to Albus and Tori,

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00:36:00,000 --> 00:36:04,000

a mere four light-years away would take 17,000 years for it to get there.

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00:36:04,000 --> 00:36:10,000

You know, that's about four times the length of recorded human history, so it's a long way to go.

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00:36:10,000 --> 00:36:11,000

Thank you very much.

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00:36:14,000 --> 00:36:22,000

This case has blown my mind. It's the big stuff, the big question. But soon we must come into a final decision.

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00:36:22,000 --> 00:36:31,000

Is a Muamua simply a shard of rocky debris? Or as others have hypothesized, is it alien tech?

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00:36:32,000 --> 00:36:39,000

Before we come to our verdict, we need to reconsider everything we've discovered so far.

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00:36:39,000 --> 00:36:46,000

So, the Muamua, the search for extra-terrestrial intelligence, what have we learned?

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00:36:46,000 --> 00:36:51,000

We've learned there's an entire universe out there and we're only beginning to scratch the surface. It's full of possibilities.

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00:36:51,000 --> 00:36:57,000

We've also learned that we're really tiny, really, really tiny in a vast universe.

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00:36:58,000 --> 00:37:06,000

We had a fascinating conversation with senior, setty astronomer, Dr. Seth Shostak, who put things in perspective.

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00:37:06,000 --> 00:37:12,000

There's a lot of real estate out there, right? There are like a trillion, trillion, with a D.

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00:37:12,000 --> 00:37:20,000

Planets and moons in our galaxy alone, and we can see two trillion other galaxies, each with a trillion planets and moons.

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00:37:20,000 --> 00:37:27,000

That's what twists my melon is, because the numbers are so big, it's almost impossible to imagine.

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00:37:28,000 --> 00:37:35,000

And we learned that a proportion of these planets and moons could provide the right conditions for the evolution of life.

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00:37:35,000 --> 00:37:43,000

We know that roughly one in five, one in five stars in the entire universe, potentially have Earth-like planets.

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00:37:43,000 --> 00:37:49,000

And then we know that there's this equation known as the Drake equation, but basically says that a small fraction of those planets

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00:37:49,000 --> 00:37:55,000

potentially can develop not only life, but intelligent life, which is capable of developing technology.

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00:37:55,000 --> 00:37:56,000

Wow.

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00:37:56,000 --> 00:38:03,000

So we know there's thousands of planets in our galaxy alone capable of hosting life, not just basic life,

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00:38:03,000 --> 00:38:07,000

but potentially advanced technological civilizations.

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00:38:08,000 --> 00:38:15,000

We also spoke to astrobiologist Dr. Natalie Cabrol, who's not only confident advanced ETs are out there,

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00:38:15,000 --> 00:38:20,000

but they could even travel across the vastness of space to Earth.

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00:38:20,000 --> 00:38:25,000

But maybe that there are other intelligent species out there that are way more advanced than we are,

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00:38:25,000 --> 00:38:30,000

that know things that we don't, and it may be that for them distances are not an issue.

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00:38:30,000 --> 00:38:35,000

We've learned that we are extremely tiny in a vast universe, as a whole, and we're not

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00:38:35,000 --> 00:38:41,000

extremely tiny in a vast universe. There's a lot of possibilities, but at the moment the only life we know of is here on Earth.

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00:38:41,000 --> 00:38:45,000

So all we know is we've got a lot of questions, but we haven't got the answers.

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00:38:45,000 --> 00:38:53,000

I think we've also learned that mathematically it's more likely that there is intelligent life out there than not.

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00:38:53,000 --> 00:39:03,000

So assuming intelligent life is out there, that further raises the possibility that a Muah Muah was sent here intentionally by aliens.

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00:39:03,000 --> 00:39:10,000

Bill Diamond, CEO of SETI, agreed a Muah Muah has inexplicable properties.

411

00:39:10,000 --> 00:39:19,000

Why did this object seem to accelerate after it went around the Sun, even though it wasn't sort of a blading material, which would act like a jet engine?

412

00:39:19,000 --> 00:39:25,000

As well as the non-gravitational acceleration, a Muah Muah was a very strange shape.

413

00:39:25,000 --> 00:39:31,000

Features that have convinced Professor Avi Loeb of Harvard, it could be alien.

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00:39:31,000 --> 00:39:40,000

It looked very weird, unlike any comet or asteroid that we have seen before, it was ten times longer than it is wide.

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00:39:40,000 --> 00:39:45,000

Potentially, this object was artificial in origin.

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00:39:45,000 --> 00:39:51,000

And even respected astronomer Dr Seth Shostak has been forced to consider the impossible.

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00:39:51,000 --> 00:40:00,000

But there is a potential there, just a small chance that this is a multi-generational alien spacecraft, perhaps visiting somewhere else in our solar system.

418

00:40:00,000 --> 00:40:07,000

Yeah, it's possible. I like the idea of multi-generation spacecraft, because they get around the problem of traveling in space.

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00:40:07,000 --> 00:40:14,000

But, you know, the speed at which the thing is going, it would have taken 70,000 years to get here.

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00:40:14,000 --> 00:40:20,000

But the most interesting thing to me was something astrobiologist Dr Natalie Cabral said.

421

00:40:20,000 --> 00:40:31,000

I think that it makes a lot of sense for an advanced civilization to build machinery that's capable of reproducing itself and spread across space.

422

00:40:31,000 --> 00:40:38,000

So, machines and robots are likely to be the first thing that we encounter, I would say.

423

00:40:38,000 --> 00:40:44,000

If the first alien object we can expect to encounter is a machine, this fits with a Muah Muah,

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00:40:44,000 --> 00:40:49,000

potentially being some kind of unmanned ET reconnaissance technology.

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00:40:52,000 --> 00:40:59,000

So, in conclusion, we've established that extraterrestrial intelligent life very likely exists.

426

00:40:59,000 --> 00:41:04,000

In fact, the universe is probably teeming with life in all its forms.

427

00:41:04,000 --> 00:41:08,000

We just don't have the hard evidence yet.

428

00:41:08,000 --> 00:41:18,000

But now we must decide, was what is surely the greatest UFO of all time a Muah Muah alien or not?

429

00:41:19,000 --> 00:41:25,000

Okay, then. A Muah Muah. Is it a rock? Or is it a rocket?

430

00:41:27,000 --> 00:41:33,000

I'm going to go, I'm going to go out on this, because I want to believe it's a rocket.

431

00:41:34,000 --> 00:41:39,000

I don't think it is. I'm going to say it's a rock.

432

00:41:42,000 --> 00:41:49,000

With a Muah Muah, you know, it is likely to be a rock, but sometimes you have to be a little bit optimistic.

433

00:41:49,000 --> 00:41:53,000

So I'm going to go out on a limb and say, rocket.

434

00:41:55,000 --> 00:41:58,000

Whoa! You've changed me, Craig.

435

00:41:58,000 --> 00:42:13,000

Whether alien technology or a pristine shard of a distant planet, a Muah Muah has provided humans with our very first glimpse of what lies in distant solar systems.

436

00:42:17,000 --> 00:42:25,000

As this most extraordinary of all UFOs tumbles onwards towards the constellation Pegasus, it retains its secrets.

437

00:42:28,000 --> 00:42:36,000

But its visit has left us with a deeper sense of wonder at what further cosmic surprises await.