Hello and welcome to space. No rocket required. I'm Sharon

Lemak, financier. So most of us don't have a rocket parked in

the driveway or a cool couple of million in the bank. And we're

more likely to describe ourselves as a space cadet than

a space entrepreneur like Elon Musk, Jeff Bezos or Richard

Branson. But in this podcast space, no rocket required. I'll

be joined by guests.

Will share with us how they got into the commercial space

sector. In this first episode. I'm joined by Alan Cross, the

North West of England space cluster manager. Hi, Alan. Thank

you. Hi, Sharon, how are you? Lovely. Thank you very much for

coming and joining us on this podcast. So as I said in the

introduction, you are a space cluster manager. What is a space

cluster and what is a space cluster manager? Yeah, that's a

good question, isn't it so.

So a cluster is, there's lots of different definitions. So I work

with the science and Technology Facilities Council, part of UK

research and innovation. So this is a Government Research

Council. We own big kind of science infrastructure like you

know, particle accelerators and supercomputers and all that

stuff. And then around that we try and facilitate how people,

researchers and how businesses can use that to advance UK

research and innovation, right. So clusters is part of that

strategy. So already talking about strategy.

Only about 30 seconds. And so a cluster basically is a is a, a

mass, a critical mass of activity. So this is in in a

certain area. So it's businesses, it's researchers,

it's an understanding of a subject. So you might have a

cluster in health technology, in digital technologies, in cyber

for space. We're looking at space now, some clusters are

just on a campus, so Harwell down in Oxfordshire is a campus

based cluster.

Also STFC, that's where our cluster model started. It's kind

of, it's a bit easy to do that because everyone's on the same

campus, you know, they're all going to the same coffee shop,

the same, you know, the same getting on the same bus. And so

you get those Connexions that you're not going to get if you

sat at home just using zoom. So it's about getting stimulating

those Connexions to develop stuff. With the Northwest

Cluster, it's the entire
northwest of England, so it's

not 1 campus.

And based at Asbury down in the
Liverpool City region near

Warrington. But the Northwest
Space cluster is Cumbria,

Lancashire, the Liverpool City
Region, Greater Manchester and

Cheshire, so it's any activity
within that.

That is connected with space.

So that's the cluster, right?
Mm-hmm. The job of the

development manager is to try
and connect everything and try

and promote it internationally
as well. There's a fair bit of

that. So I try and stay on
brands. I talk about a

constellation of capabilities,
right. OK. So there's lots of

stuff going on here where we are
at the moment in Lancaster.

There's lots of space work going
on. There's stuff going on in

Cumbria, in central Manchester
all over. So how can we want?

Get those little knots of
activity talking to each other

to support each other, but how
can we interlink them across the

cluster and then how can we link
that nationally and

internationally?

Wow, yeah, I'm none the wiser,
people. I hope no one stands off

the podcast, so not for me.
This.

Can you give us an example of
some of the activity that's

happening in North West? Yes.
So. So you can't just battle in

and go right. Everyone do space
right, doesn't work face well,

you got to understand what space
is, right. And people tend to

think it's about rockets and
spaceships, which it is. But the

space economy in the UK is worth
16 1/2 billion pounds a year and

only 1/4 of that, in fact less
than a quarter, 23% of that is

the building and operation.

Of rockets and satellites and
spaceships, right, 23%. The rest

of it, the vast majority, more
than 3/4 of it, is the use of

the data. Yeah, we don't send
the Rockets and the satellites

up for fun, right? You send them
up to do stuff. And some of

that's about space science. But
the vast majority of the

activity from the satellites is
in the generational transcending

of data. So positioning,
navigation, timing, signals,

satellite communications,
observation data.

So that's what space is. Most
businesses in the space sector

aren't building rockets, they're
using data from space to address

a challenge on Earth, like

tracking your pizza delivery.

That is there anything that the
listeners might think be using

or be familiar with that comes
from this area? In terms of

that, I mean everyday. So if you
have to click your fingers now

and switch off all the
satellites, human civilization

grinds to a halt almost
immediately.

So the, the position,
navigation, timing signals we

think of sat NAV. Yep, right.
And people go, well, that's just

sat NAV. That's not well. The
SAT means satellite, doesn't it.

Every time you drop a pin,
you're interacting with a

billion dollars worth of
spaceships, right? So the time

of signals from them, they do
things like they, they time the

National Grid.

So that these massive energy is
huge amounts of energy moving

through the grid and you've got
to be very accurately timed on

when the switches go moving from
one place to the next. They use

this millisecond timing signals
from space to do that. You know

I've I've mentioned pizza
delivery there's things around

healthcare technologies and
sport event photography and

there's so much and but what
happens is it, it's underneath

it sits on this.

These technologies sit
underneath so much of our daily

activity. I remember someone
telling me that in the future

all farmers will need to be
satellite experts. And I said,

don't talk nonsense. I said,
when I'm going from here to

there, I don't need to be an
expert in satellite

technologies. I just push the
button and it tells me how to

get there, right? The farmer
wants to stand in his fields

with his phone and go, hey
phone, what should I plant here?

And then the phone, the service
that some entrepreneurs built,

connects to.

And it looks at market prices
and and and you know weather

patterns and data from space and
a whole different range of data

not just from space and it goes
carrots and then implants

carrots, right. That's the and
so it's this, the space industry

underpins so much activity.

That most people are unaware of,
so it takes me back to.

Those examples of space and and
and what does the manic cluster

manager do? So, examples of what
we've done.

So we're currently.

We've when we started the Northwest Space cluster only in

May, only about nine months it's been going.

And we looked at what are the strengths in the Northwest?

What are we good at? What do the local, what are the local

governments of Cheshire and and and and Lancashire and all

these? What are they want to do? What are their priorities? OK

let's see how space can fit into that. So things like advanced

engineering, manufacturing, the Northwest builds stealth

fighters and nuclear submarines. So how can we get those supply

chains also looking at space. So that's a project we're working

on with the Northwest Aerospace Alliance. How can we support

small or large businesses in fact pivot into space if they're

building a widget for a stealth fighter can they do it?

With satellites and another one is around cybersecurity,

obviously cyber is a huge thing in this part of the country, so.

You know, when I started in the space industry in 2018, there

was about fifteen 1600 satellites and there had been

for decades really quite stable number. Now there's about 8000

satellites. By the end of the twenty 20s, they'll be about

60,000 satellites. And satellites used to be what's

called a bent pipe. So signal goes up, signal comes down.

Now these are mega constellations. So the the

satellite are talking to each other in space. So you then get

into mesh networks and edge computing in space and and

there's real challenges around cybersecurity, how that data is

managed and moved. And that's a huge opportunity I think for the

Northwest. And another really interesting one is nuclear

energy for space.

So there's, you know, Lancashire, Cumbria, fabulous

world leaders when it comes to nuclear technologies.

We've just got a Â£19 million investment from the UK space

Agency into this part of the country because what we're doing

is.

And.

There's a type of of of of nuclear power source used in

space that uses plutonium not as a propulsion but just as a heat

source and to generate electricity. Mars Rovers use

these. Anything a bit further away from the sun or anything in

deep shadow like on the moon, can't rely on solar energy. So

you need these different sources. Usually these these

space batteries as we call them, use plutonium, which is very

expensive. There's not much of it. We need it for all kinds of

different things.

What we figured out in this part of the country is.

How to do those space batteries using nuclear waste?

So we're taking the nuclear waste that's buried in

Sellafield in Cumbria and turning it into a usable power

source off Weld.

So now.

You've got a cheaper energy source. We don't have to rely on

Russia or America for the plutonium.

European that the European market would aim at.

Europe then has this sovereign capability around nuclear energy

for space, safe nuclear energy for space.

And we get rid of our nuclear waste.

Yep. So the Northwest has got quite a lot going on and people

tend to think of, you know, big rockets taking off for northern

Scotland, for example, or or Newquay with this horizontal

launch. But actually a lot of activity is right here in the

Northwest. Fantastic. I don't think a man knew that there was

that much going on in this area. Thank you for that. Now you, you

kind of touched on it when you were when you were answering

that last question that you joined the space sector a couple

of years ago. But actually have you always been interested in

space and how did you get into this?

This sector I've always been a.

Bit of a geek, right? OK, I've always been a dweeb, but a dork

or whatever, it's not like a cool thing. I've just been

straight down the line honest about what interests me, right?

And that was space. But I didn't go out, you know, at school. I

didn't do maths and physics and and then go into engineering or

or or astronomy or and then go into the space sector, right?

OK, I am fundamentally quite lazy and and I I was an actor,

right? And so you wake up in the morning and you can act.

Or sing. You can get better, but when you wake up you can act.

What kind of acting did you used to do?

Award-winning ohh.

That was all right. That was good. That was good. But so did

Shakespeare's Globe with Andrew Garfield and Mark Rylance and

various people but the BBC in Scotland. But so you wake up in

the morning, you can act, get better, but you can act. No one

wakes up in the morning and knows Kepler's third law of

planetary motion, right. You've got to study for that. So the

path of least resistance for me was to act. And so I went to

drama school in in Edinburgh.

And then went on and did some acting and from that and then

became a singer because because you could, I could make more as

a singer. So I became a singer and I was singing for well over

a decade.

Internationally ignored.

And it's a chance singer, yeah. Yeah. So big, big band, swing

stuff. So Sinatra and that kind of stuff. But I was always still

interested in space, right? So I was always actively engaged in

space. And in 2007 I joined the British Interplanetary Society,

which is an open society. Anyone can join or join that. And found

immediately had found my tribe.

So it was originally founded in Liverpool in 1933, but it's now

based next to a big it's got a big snazzy townhouse down in

London, just over the road from MI6, right, dead, dead cool. And

so used to go down there and go to the the the lectures and

whatnot and got chatting to people. Really enjoyed these

people's perspective on things and got to because I was the guy

sat at the end of a bar in Liverpool.

Telling people about, you know, all dynamics. After a few drinks

they've got that one back energy, so I could then find

somewhere actually talk to them.

And then that led me down a path. And then? And then in

2013, the government started to make serious noises about

spaceports. So the UK Space Agency was founded in 2010.

2013 they realised that the UK builds loads of satellites.

Small ones, little ones, you know size of a loaf of bread to

the size of a washing machine mostly in Glasgow now it turns

out some sort of quite a lot of sorry but the little ones

Glasgow makes more satellites than anywhere on Earth outside

of California. Phenomenal. The sensitive Glasgow it's amazing.

So, so we're good at building satellites, designing them.

We're good operating them but we weren't launching them and that

was a missed market and it meant that we do a lot of the design

and and building work and.

Then because the launch was going to another country. They

then kept the operation side of it, so in order to kind of

capture that market that end to end market. We UK decided it

wanted to space ports at the time it wanted a spaceport

single spaceport, either vertical launch like a

traditional rocket and for polar orbits really good for Earth

observation because you go round around north-south, north-south

and the world turns beneath you can scan the whole planet or air

launched.

As we saw with Virgin orbit, so you a plane takes off from a

runway, flies to it, needs to any orbit, any direction, which

is really cool, which is really cool. It's not so cool watching

the take off because it's plane taking off. Yeah and then it

lands you go OK that was fun. So I when this came out in 2013, I

then said so they would talk about Prestwick and Glasgow

Newquay and Cornwall Flambards in Snowdonia and these are East

West facing.

Jason slightly isolated and I said why not John Lennon Airport

in Liverpool, right, which faces a kilometres of river estuary,

entire South of it is is is the

kilometres to the South because

it's on the river. Is is is
clear Stanlow oil refinery for

fuel and it's easy to get to
you. It's an active airport.

You'd need to extend the runway
a bit.

There are houses close by, but
they're no closer than say,

Prestwick so why not John Lennon
Airport? And, and people said,

oh, you couldn't do that. I said
why not? And he said because you

couldn't. I said, well, why not?
And they couldn't give me an

answer. So this is when I was,
you know, singing in the Hilton

on a Saturday night. I was then
spending my days.

Putting together a presentation
and annoying local politicians

and annoying the owners of the
airport the operators and and

then at national level getting
in touch with the space agency

going. Why are you looking at
what's going on here in

Liverpool from that I did a
presentation at a hotel so

something called CAFE Scientific
which was like a like a little

mini version of a Ted talk but
like all look like local

community led and I got in touch
to say could I come and I've got

this idea like to give.

Presentation. There are 20
people turned up and from that a

group of five of us.

Went well, let's respond to this government consultation.

Let's respond to the consultation using John Lennon

Airport as a case study.

Right. Yeah. So we did it and we had an environmental consultant.

We had a guy who designed the Skynet system at military

satellites in the 80s, who'd been out to American and

launched satellites. We had a guide, been a rocket propulsion

scientist at NASA, who are all living in Liverpool in and

around Liverpool, right. And we all got together and we

responded to the consultation.

It turns out the complexity of the airspace due to the

proximity of Manchester Airport was an issue and that was really

what what meant. You couldn't do it there, but from that.

We then discovered that, you know, all this stuff about the

Northwest.

It's the biggest aerospace cluster in Britain, one of the

biggest in Europe. The work on the nuclear submarines, you

know, graphene was invented here. We've got the country's

most powerful industrial face and supercomputer at the Hartree

Centre. There's a huge amount of digital and engineering, which

is the space sector, right?

And yet when we looked at the official figures.

The northwest of England, which generates 9% of GDP on average

across all sectors which generating something like 0.003%

of the space economy, it was it was wild how underrepresented it

was.

So the working group then reformed as the Northern Space

Consortium, which we set up as a Community interest company, and

it was literally just the five of US meeting.

You know, once a fortnight in a in a hotel lobby and having a

coffee and and talking about stuff.

And not just talk about stuff you know we we were putting

pressure on local political leaders and local business

leaders and and and putting pressure on the space agencies

to to take note of what was going on at the time the space

agency had did have a regional engagement office but that at

the time the regions and this will annoy you the regions where

Wales Northern Ireland and Scotland and my point was

they're not regions their nations the regions is a smaller

thing that they've now come round to that not cause me

they're on that path.

Anyway, so there was just, it was very difficult, but we.

Battered on, eventually the mayor of Liverpool gave us the

Cunard building that the what was the first class? And embark

on embarkation.

Lounge whatever it was for the Titanic with with this fabulous

fabulous room they gave us that and we put out for free and we

put on a conference and we we got some funding from the Robert

Heinlein Foundation over in America. The guy who wrote

Starship Troopers and all that his estate gave us some money to

do it and we and we we put on this this path day confidence

said look here's the case for space we've got the universities

and business leaders and politicians and and made the

case and the UK space agency used that event they changed

that event and and.

Announced the launch of their Incube national incubator, so we

made a little bit of an impact 5 fellas drinking coffee in a

hotel bar.

And that was the beginning of it really. And then in 2018, a

programme from the European Space Agency called Business

Applications, which is a round support and the use of satellite

data.

For commercial purposes in different sectors.

And they created these regional ambassador roles to help.

To help businesses in the different parts of the country

access this funding to to increase the use of satellite

applications on Earth and in the Northwest there was only really

me you know people went really looking at it and and so I they

they hinted that I should apply and and I didn't.

Really. Why? Because I thought, I'm, I'm a jazz singer, I'm, I'm

what? You know, I'm flying all over the place at this point.

I've done a bit of distance learning in astrophysics and a

couple of modules and enjoyed it, but very quickly butted up

against my mathematical limitations. And so we're kind

of, you know, always been doing stuff in the background.

And I didn't apply for this job and the the deadline went. And

once the deadline had gone, I thought, you know what?

Should have gone for that. Yeah, I never would have got it, but I

should have gone for.

And then the.

Space Agency and the the
organisation that was hosting

the role locally, which is the
science Technology Facilities

Council.

At their site at Glasbury, both
got in touch with Alan. We have

extended the deadline on this
job.

OK so then I applied and I got
it and and then my head fell

off.

Gosh, what a story. And it just
kind of shows as well about that

self-confidence isn't it about
how we're our worst enemy

sometimes? Ohh I've I've you
know, clinical imposter

syndrome. Yeah.

All everyday. Could you imagine
seeing someone else doing that

job that you could have done? Do
you know if something had? I

wish they had.

If something hasn't been yeah.
Oh yeah. It's funny. It's, it's.

I've also hit a big birthday and
I look back and think, well,

what could a birthday? 44 and
5th floor technically and then

and I think back.

To 29 year old, Alan just
wouldn't.

Wouldn't believe you.

Wouldn't have believed that
would have been 10 years on and

what would happen, though,
because I was a singer.

Because at that, that just was
not the path. That was not the

path that I was on.

Yeah, but actually what happened
was the skills that had

developed.

In performance we're really
useful and actually what what

the NW needed.

So the guy in the southeast was
fabulous at his job, technical,

you know, from an Earth
observation background and

weighting universities. That's
what the southeast needed

because there are loads of
people apply it, right? So they

needed someone who could sit
down with the paperwork and

that's a good idea. Maybe that's
not happy. Thought about your

business development and do all
that stuff. What the northwest

needed a bit of that, but what
it needed was someone who could

get up and talk about it because
no one had ever applied to this

fund from the northwest. They
needed someone who could stand

up and was comfortable talking
about it.

And that's one of the things
about space that we keep on

hitting against, is that the way
that the words and how people

articulate it in the vocabulary
is really complicated, you know,

and it kind of goes over your
head. It's almost as if it's an

elite club that you can't get
into unless you understand the

vocabulary. So I totally
understand where you're coming

from that if you can simplify it
and you can actually make it

accessible.

To lots of other people then
they can actually start to think

about space as an option. Yeah,
absolutely, cause it's not as.

Yes, it needs engineers, yeah.

But it needs everything else as
well. It needs you know managers

and and social media people and
HR and and people with ideas. I

sort of, I sort of great quote
just yesterday and I thought I'm

having that and it said the
difference between the old way

of doing space and the new way
of doing space, right, the old

way of doing space said I need
this money.

To do this cool thing, and the
new way of doing space is I need

to do this cool thing to make
this money, right? That's how

the rest of the economy's always
worked. I need to do this to

make money. Space never did for
very stoical reasons around the

fact that they were, you know, essentially nuclear delivery

devices and you couldn't open the market up. And that's what's

changed. And so now it's not about how do I fit in. I want a

career in this or I want to start a business in this. How do

I fit into what's already being done? It's what can I do?

What's my idea?

And what's the market for that? And that, that's perfect. That

takes me nicely onto my question. So what is a space

business? How do you know that you're in the space sector? Most

people don't, OK.

You know space companies you've never heard of or you have but

don't know the space companies? Uber.

Uber is a space company without interacting with billions of

dollars worth of satellites.

Uber doesn't have a business model.

Right.

So what does the space company look like? You've got upstream

and down, upstream, downstream and midstream. So you upstream

are you people who are building your technology, the people who

are building rockets or building satellites or sensors or power

systems or any of these things
that are going to go into space

or building the ground systems
that interact with space, right?

So there's a great company here
in Lancashire called Forsberg

services, right. So they
specialising in position,

navigation, timing, right. There
is a business when you, if you

spoke to him a few years ago and
said what's your business,

they'd say you don't maritime,
aviation, defence, all these

things.

Now they understand their space
business, OK? They're not

building any in the flies into
space.

But they're building hardware
and developing services to

interact with data from space.
Yes, there's a space that's a

good example of an upstream
company that isn't necessarily

flying things in space. Then
there's the downstream Uber.

All these companies that are
using data from space, and it

might be, there's a great one
that that the European Space

Agency co-founded, which was
called Beeline and it was a bike

bell, right? Right. It was a
smart bike belt and.

You guys on your bike and you've
gone on your phone, you said I'm

cycling to this place and.

Interacted with the bell and the bell then had lights around it.

So. So you know, having to look at your phone, essentially there

was a countdown. So you need to turn left and 100 metres, the

green light comes on and then as you get closer and closer, the

green bit ticks down and then it flashes. Now I turn. So that was

enabled by satellite positioning.

But then it was then feeding back into into into a service

underneath that that was in a enabled.

Safety for the bikes. So what was the safest route, right,

which which not just Google, but which a lot of the standard map

and options won't. If you're a cyclist aren't going to give you

the safest route, or the least hilly route, you know?

Please what what is this was learning from all those

aggregated roots and and so it wasn't about the satellite data.

It was about the cyclist, but it was enabled by satellite data.

Cool idea is, isn't that?

Yeah, I think. But that's the thing though, is you don't

actually think about how space is influence in every part of

your daily life. So what what do you think is the biggest barrier

really for people entering the space sector? So if you've got a

really cool idea, you'd want to be a space entrepreneur. What is

the biggest barrier facing the mentor in the space sector?

That's a good question that I I would say the biggest barrier to

entering the space sector is understandable. The space sector

is right.

And of course, in any business, it's funding, right? It's

getting the money together.

And.

There are lots of options out there in terms of funding. You

know, I've mentioned for example ESA business applications, so

that's designed that will fund 50% of development costs to get

your service to market. And things like the ESET business

Incubation Centre, there's foresights across the UK.

Start up businesses doing anything to do with space, not

as some people once did, said we want to print shirts and we

could do space. Can we have some money and joining?

Could you plan on a T-shirt now that's not going.

The chance that's true, yeah. You don't actually don't get. So

yeah. So there's there's obviously a funding issue around

that and I think.

And.

Networks.

OK, you know who who do you speak to about this stuff?

You know, if you want to go into automotive, you can kind of

figure that's not too difficult. If you want to go into social

media, it's not too difficult or or you know side, but it's not

too difficult to find but space who's there. I think that's

where clusters are really useful. You've got an immediate

connexion, someone who can come in and help you and point in the

right direction.

Yeah, yeah. It's it. It is. It's difficult.

It's it's.

If it wasn't difficult.

We'd be on Mars, yeah. I mean, we wouldn't need that support if

it wasn't difficult, so.

Yeah, getting the idea and getting that sometimes getting

there. There's there's two different sides of this I think.

So you've either got some of the great idea who spotted a gap in

the market.

Yeah, but doesn't have the technical.

Know how? Right. That's kind of where I'd sit in that. It

doesn't. It doesn't have that technical understanding of,

well, I know what we need to do, but how do we do it? Support is

available for that. Of course, the other side is someone who's

very technical, realises they've got a great thing, but doesn't

have any understanding of what the market wants.

And again there is support available with that. So there

are different challenges for different.

Starting points.

But there is help available.

OK, you never answered my question really.

Because actually what was the biggest challenge really? OK,

well go. The biggest challenge is you've, you've got to

accelerate mass to, you know, 5 miles a second and get a 250

miles. Now you're showing off.

Yes, that one. Yes, that one packed, didn't you? Yes.

If you could go to space, would you go to space? In a heartbeat.

Why? Why? Yeah. Why would you want to go to space? I feel like

Captain Kirk now. Because. Because it's there.

Yeah, because it is. You know why you why did you get out of

bed?

Because we have to get out of bed.

Ohh, you only ever get out of bed because you'd have to. Yeah,

like being in bed.

Why stand when you can sit on my sit where you can lie down?

Right. Philosophical questions? No, but no. But what you know

why? Why do people go for a walk? Why do the study? Why do

they go on holiday? Why do they go to this shop and not that

shop? It's there. The Earth is not isolated. We we.

We OK, we we we've evolved to deal with threats that are

immediate and challenges that are immediate. Right align 10

feet away is a bigger challenge than a line 100 feet away, which

you know is more important than a line a mile away, right. And

so we've evolved to think on these scales.

Of what's immediate now and we don't think on a planetary

scale, no. And the challenge we most of the challenges we face

in today's society is because we don't think on a planetary

scale. If we look at problem challenges with the climate, if

we look at challenges and threats to democracy, these are

often underlying that is is a localised narrow viewpoint that

then compounds bigger problems

the earth.

Is not isolated. The Earth is
not floating in nothingness. It

is part of a much bigger system.

That is an active system. Just
recently, an asteroid flew 3000

kilometres above the tip of
South America. In 2018, a

military base called Tulele in
in Greenland's got into trouble

because it didn't report that it
hadn't been destroyed by an

observed, observed meteor impact
2013. The town of Chelyabinsk in

Russia, hundreds of people
injured in 1997 and 1948 impacts

big enough to wipe out entire
cities happened in 2002.

Going to get into it now, it's,
you know, just crossed. I'm

getting a bit worried. Yeah, I
only asked you. It's not simple.

It's not a simple question. Like
the 2002 Eastern Mediterranean

event was an asteroid impact, an
air base that exploded in the

upper atmosphere north of Libya
over the Mediterranean Sea with

the power of a small tactical
fair strike nuclear weapon. Had

that arrived an hour or two
later. This thing's been around

for 5 billion years.

If it had arrived an hour or two
later, which calculates down to,

I don't know that.

And a difference in speed of the

width of an electron per year.

It would have exploded over the Kashmir region.

And at the time?

That was in dispute at all was in dispute. But at the time,

Indian and Pakistan were on hair trigger nuclear alert. And if

that would have, if that had come in an hour or two later,

it's highly likely that each side would have presumed the

other one had done a fair strike.

And that could have unleashed nuclear war.

So why go to space?

Because we have to. Because it impacts our life on Earth.

If we don't.

We we can't do what we're doing and stay on, stay here. We can't

fix the earth. If your house is falling apart, do you rip up the

cake, the carpets, to fix the windows? Do you stop peeing in

the sink because the toilets broke?

Or do you go to B&Q?

Do you leave your house to go to B&Q or what? You know

wherever to get the stuff to come back and fix it. So there

are materials, that is energy.

Out there, we should be designating the earth as a

National Park. We couldn't using nearly twice the Earth's

regenerative capacity. And that's for only about 1/4 of us

to have our current lifestyle. Most people don't have our

lifestyle 8 billion when there's 11 billion of us at the end of

the century. How do we support 11 billion people with our

lifestyle on one planet? You can't. But if you can designate

the earth and National Park and say you can't use more than half

the regenerative capacity. Let the planet heal the where you

get your energy from, it's above our heads.

There's more energy come from the sun than we could ever use.

There are materials, there's planets and planets worth of

materials. I don't. I'm not talking about strip mine and

Mars or the moon. I'm not talking about that. I'm talking

about using lumps. The lumps of rock that are going to hit us at

some point using them. They're net.

This iron, there's phosphorus, there's Iridium, there's gold,

there's rare earth metals, there's rare earth metals are

rare because they're not from Earth. They arrive here by and

large. Or meteors.

We don't live on an isolated

planet. We've got to grow up.

And accept that fact.

So that's why we should be going
into space. That's why I want to

go into space. Wow, that was the
answer. And you said you didn't

know much about maths or science
or things like that. I think you

were lying earlier. But in a
philosophical perspective, do

you know on a more personal
level why space? I know what

you're saying about, you know,
the future of the planet and

things like that, but is there
something personally that you

hope that you would find in
yourself you were able to go to

space? I just want to see what
it's like.

That's why I wanna live long,
you know? And that's why I don't

want to die at 90, because I
want to see what happens. Yeah,

I know. Not enough time, right,
Alan? The last thing. OK, so

Jeff Bezos once said that great
industries are never made from

single companies. There is room
in space for a lot of winners. I

wonder what you think about
that.

Well, as I said, space is big.

There's lots and lots and lots
of things to do, science and

opportunities. And it's
interesting with Jeff Bezos

because we tend to
understandably look at them in a

with a slightly cold eye. You
know, we look at business

practises and how workers are
treated as some of his companies

and it's a real challenge in
these immensely wealthy and he

started Amazon, that him
building rockets is not a vanity

project. I want to say that
right now he is on record

talking about this, he started.

Amazon to start a space company.
Yeah. The point of the of the

Rockets is not and in his really
looks like a Willy right new

shepherds it really it's really
following right and so people

well just who's got the biggest
rocket him and him and Elon

Musk.

Both set out to build space
companies, and they both set out

not for the sake of building a
space company, but they both

read a book.

From the 1970s called the High
Frontier.

And.

In the.

In that book, they talk about
essentially what I just spoke

about the the wealth of
resources that are available and

opportunities and space that is
there. And in order to

essentially save the world,
you've got to relieve the world

of the burden of civilization.

And you do that by accessing the
incredible resources that are in

space. And this is what he's
talking about there. That's what

vasos means by that. That isn't
done by NASA.

Or JAXA or ESA or Roscosmos
isn't advice. Or SpaceX, or blue

origin. It's not done by a
single entity, much in the way

that when you go to a
supermarket, not everything is

by a single company. Not
everything is the same. You

don't go to a supermarket and
get 100 aisles of bread.

There's lots of choice, yeah.
And that's what drives our

economy. Is is that that?

Relatively free movement of
ideas. Fantastic. What a great

answer. Thank you, Alan. Thank
you so much for your time. Do

you know I've had such a good
time actually here and you're a

wealth of knowledge.

Any chance you might come and
join me in the next podcast and

Co present?

I yeah, I see. Yeah. That's
great. Thank you.