



DOWN TO EARTH

EPISODE 2



A Giant Astronomical Machine

1
00:00:00,506 --> 00:00:18,656
[Music]

2
00:00:19,156 --> 00:00:21,176
>> I thought I knew what
the Earth was all about,

3
00:00:21,176 --> 00:00:23,416
just because I'd looked
at it with pictures

4
00:00:23,416 --> 00:00:25,536
and video and all these things.

5
00:00:25,536 --> 00:00:31,436
And it's like seeing some
travelogue in some exotic place

6
00:00:31,436 --> 00:00:33,906
on Earth and calling that
your vacation, right?

7
00:00:33,906 --> 00:00:36,076
We do not do that,
as human beings.

8
00:00:36,076 --> 00:00:38,746
We want to physically
go to these places,

9
00:00:38,746 --> 00:00:41,846
because the experience
is different,

10
00:00:42,436 --> 00:00:45,696
and it's the same thing
when you go into space

11
00:00:45,696 --> 00:00:46,976

and you look at Earth.

12

00:00:47,076 --> 00:00:51,586

You know, intellectually,
what Earth is like from space,

13

00:00:51,586 --> 00:00:53,306

because we've all
seen the pictures,

14

00:00:53,506 --> 00:00:55,546

but it's not being there.

15

00:00:55,546 --> 00:01:01,086

The human experience
aspect of space doesn't come

16

00:01:01,086 --> 00:01:04,996

until you can relax
a little bit.

17

00:01:04,996 --> 00:01:10,336

Now, that happened, for me, when
I was taking my space suit off

18

00:01:10,936 --> 00:01:15,166

and I remember floating up to
the flight deck, and you look

19

00:01:15,166 --> 00:01:19,896

at the overhead windows
and Earth was there,

20

00:01:20,086 --> 00:01:24,026

and it was such an intense blue.

21

00:01:24,026 --> 00:01:29,386

We were somewhere over the
ocean, and it was an intensity

22

00:01:29,386 --> 00:01:33,786

of color that no
photography, no video,

23

00:01:33,786 --> 00:01:37,136

no movie, no film can capture.

24

00:01:37,136 --> 00:01:42,286

You can parse more
and more details out.

25

00:01:42,286 --> 00:01:44,836

When you first look at
Earth, you may say, "Wow,

26

00:01:45,126 --> 00:01:48,826

that's a continent,"
and then you look

27

00:01:48,826 --> 00:01:50,466

at it again the next
day and say, "Wow,

28

00:01:50,536 --> 00:01:52,376

there are mountain
ranges," and then you look

29

00:01:52,376 --> 00:01:54,226

at it again the next
day, and it's like, oh,

30

00:01:54,226 --> 00:01:57,626

I can see synclines
and anticlines

31

00:01:57,626 --> 00:01:59,496

in the geologic structure,
and oh,

32

00:01:59,496 --> 00:02:02,926
there's the rain shadow
effect, and on and on and on.

33

00:02:02,926 --> 00:02:07,966
So, the more time you have to
look at Earth over a long period

34

00:02:07,966 --> 00:02:11,646
of time, the more you can see.

35

00:02:12,516 --> 00:02:16,586
[Music]

36

00:02:17,086 --> 00:02:20,526
So, there's more to see in space
than just looking at Earth.

37

00:02:20,856 --> 00:02:27,226
You look out at the cosmos,
and there's many things

38

00:02:27,586 --> 00:02:32,336
in the cosmos that are
noteworthy to gaze at,

39

00:02:32,666 --> 00:02:35,846
for example, the
Magellanic Clouds.

40

00:02:36,216 --> 00:02:39,526
Those show up really
bright and vivid

41

00:02:39,526 --> 00:02:41,556
because you don't have
atmospheric scattering.

42

00:02:41,826 --> 00:02:43,526
You can see Andromeda.

43

00:02:44,066 --> 00:02:45,386

It's a little fuzzy spot.

44

00:02:45,386 --> 00:02:47,146

On a really, really dark night

45

00:02:47,146 --> 00:02:51,056

with good vision you can
faintly make out Andromeda,

46

00:02:51,126 --> 00:02:53,446

but in space, it
just stands out,

47

00:02:53,446 --> 00:02:55,776

because the contrast
is so stark.

48

00:02:55,986 --> 00:02:58,296

So, there's all kinds
of other things to see.

49

00:02:58,526 --> 00:02:59,486

There's the moon.

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00:02:59,656 --> 00:03:01,936

It goes through its phases.

51

00:03:02,076 --> 00:03:04,996

The angle that the moon
makes when it rises,

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00:03:05,236 --> 00:03:08,136

relative to your
spacecraft, changes with time.

53

00:03:08,136 --> 00:03:10,086

It's almost like your

spacecraft, itself,

54

00:03:10,396 --> 00:03:15,246
becomes a giant astronomical
machine and it's, like, okay,

55

00:03:15,246 --> 00:03:18,626
the moon was rising
over here two weeks ago,

56

00:03:18,626 --> 00:03:21,756
and now it's rising over
there, and why is that?

57

00:03:21,756 --> 00:03:24,556
And then you think about the
orbital dynamics, where we are

58

00:03:24,556 --> 00:03:26,186
in our solar system,
this and that,

59

00:03:26,386 --> 00:03:27,456
and then it all makes sense.

60

00:03:27,916 --> 00:03:35,056
So, there's so much to observe,
more so than just planet Earth.

61

00:03:35,056 --> 00:03:38,836
I think it's important
to share our experiences

62

00:03:39,036 --> 00:03:43,116
with all the people who, as of
today, don't have a chance to go

63

00:03:43,396 --> 00:03:46,726
into space, but the more
people that we can get off

64

00:03:46,796 --> 00:03:49,956

of this planet to have
these kind of experiences,

65

00:03:50,706 --> 00:03:57,056

the more growth you will see
in ideas, and the viability