

A man with grey hair and glasses, wearing a dark suit, white shirt, and patterned tie, stands in front of a large, semi-transparent globe of the Earth. The globe shows the continents of Africa, Europe, and Asia. The background is a modern building interior with large windows.

Jim Garvin

NASA Goddard Chief Scientist



1

00:00:00,069 --> 00:00:04,379

The Portuguese explorer Magellan left his legacy in the first

2

00:00:04,960 --> 00:00:09,569

circumnavigation of planet Earth our first orbital experience of our home planet and today we're

3

00:00:10,030 --> 00:00:12,719

looking forward 500 years from that first voyage.

4

00:00:12,910 --> 00:00:17,670

We see the expanse of space the cosmic ocean that we've since conquered and

5

00:00:17,920 --> 00:00:25,680

today as we look forward beyond the legacy of Magellan we can see where we'll go in the next 500 years into t

6

00:00:29,679 --> 00:00:31,179

Earth,

7

00:00:31,179 --> 00:00:33,179

the ocean planet.

8

00:00:33,190 --> 00:00:40,259

The Portuguese explorer Magellan gave us the first orbit of our own planet 500 years ago today.

9

00:00:40,260 --> 00:00:42,260

We see Earth through new eyes, through

10

00:00:42,340 --> 00:00:47,639

satellite views that show us the Earth's oceans that Magellan experienced himself from space.

11

00:00:48,219 --> 00:00:54,809

Little did he know as he sailed the oceans, we can look forward 500 years to the cosmic oceans that today

12

00:00:54,809 --> 00:00:56,809

we sail. Magellan's ships

13

00:00:56,980 --> 00:01:00,719

carried him around our Earth at a time when it was unimaginable.

14

00:01:01,750 --> 00:01:08,369

Now his legacy lives on in space through spacecraft named for Magellan who set sail from a space shuttle

15

00:01:08,710 --> 00:01:13,529

30 years ago to map our our sister planet Venus in all of its glory.

16

00:01:13,930 --> 00:01:16,889

Perhaps it's former ocean world as was Earth.

17

00:01:17,200 --> 00:01:22,830

The cosmic ocean calls us every night across the Milky Way into the space.

18

00:01:22,830 --> 00:01:26,819

We now experience through the eyes of the Hubble Space Telescope and beyond.

19

00:01:27,189 --> 00:01:34,229

This cosmic ocean is a forever frontier for humanity and it lives on in the record of space exploration.

20

00:01:35,610 --> 00:01:36,530

50 years ago

21

00:01:36,530 --> 00:01:42,530

we explored space from beyond Earth at the Moon as the voyages of project Apollo gave us 'Earth Rise.'

22

00:01:42,840 --> 00:01:44,790

You see our ocean world

23

00:01:44,790 --> 00:01:52,010

from the landscapes and the barren landscapes of our nearest neighbor a Moon or its seas are frozen in rock.

24

00:01:52,560 --> 00:01:56,900

Today through spacecraft known as the Lunar Reconnaissance Orbiter,

25

00:01:56,900 --> 00:02:01,370

we can see the Moon up close as if we were there flying over its surface.

26
00:02:03,930 --> 00:02:08,449
We can also imagine living with a star, our planet Sun

27
00:02:08,790 --> 00:02:14,989
Our Sun drives the energy of our solar system and it shows us what other stars are like today.

28
00:02:14,989 --> 00:02:20,449
We've set sail to get to know the Sun even better through a mission known as the Parker Solar Probe,

29
00:02:20,820 --> 00:02:27,679
because the Sun's energy drives the circulation of our oceans and our planet. We move on to Venus our sister

30
00:02:28,200 --> 00:02:32,000
where the spacecraft Magellan gave us the views that carry our

31
00:02:32,280 --> 00:02:37,699
imagination to the cosmic oceans of this world where we believe its oceans were lost in time,

32
00:02:38,489 --> 00:02:44,959
billions of years ago. And from Venus on to the planet Mars where we ask the tough questions. Are we alone?

33
00:02:45,239 --> 00:02:47,779
Is this a place we're going and on Mars?

34
00:02:48,090 --> 00:02:54,290
We know the record of water is lurking in the rocks in its climate history and we look beneath its landscapes

35
00:02:54,570 --> 00:02:59,540
into the story of those rocks from the voyages of spacecraft known as

36
00:03:00,299 --> 00:03:02,449
curiosity the Mars Reconnaissance Orbiter.

37
00:03:02,820 --> 00:03:08,989
These spacecraft show us the rock escapes where the record of the oceans and the seas and the lakes of Mar

38
00:03:09,269 --> 00:03:11,329

written in the stones of time.

39

00:03:12,030 --> 00:03:16,610

So from Mars, we can see also the record of water in planets like Jupiter

40

00:03:17,160 --> 00:03:23,120

where its beautiful systems of clouds and circulation can be captured with spacecraft

41

00:03:23,400 --> 00:03:25,429

through the minds eyes of humanity.

42

00:03:28,080 --> 00:03:32,540

We move on to the beautiful planet known as Saturn where when we see

43

00:03:32,970 --> 00:03:38,779

Earth that the scale of Saturn. We imagine how small we are in that cosmic ocean and from

44

00:03:39,570 --> 00:03:41,570

Saturn we can look at its largest moon,

45

00:03:41,790 --> 00:03:47,870

Titan, where oceans exist but not of water little did Magellan know that these other worlds,

46

00:03:48,330 --> 00:03:51,320

ocean worlds, would harbor different kinds of fluids.

47

00:03:52,080 --> 00:03:58,969

Today the ocean universe is dramatic. We see the even at the planet known as Pluto, now a dwarf world,

48

00:03:59,130 --> 00:04:04,159

but still in its landscapes the magic of what an ocean world might have looked like

49

00:04:04,500 --> 00:04:08,450

Beyond Earth it gives us the views that we can expect of

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00:04:09,120 --> 00:04:11,120

oceanic worlds around other stars

51
00:04:11,550 --> 00:04:12,990
light-years away

52
00:04:12,990 --> 00:04:14,430
unseen by humanity.

53
00:04:14,430 --> 00:04:20,059
But our vision airing of them carried by the grand telescopes in space takes us there.

54
00:04:20,520 --> 00:04:27,319
Extending our presence Hubble and next up is the James Webb Space Telescope a cosmic Voyager like Magellan

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00:04:27,840 --> 00:04:34,280
Launching in 2021 it'll extend our imagination to those worlds and the bigger cosmic ocean

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00:04:34,590 --> 00:04:39,890
landscapes that we can only see in our minds eye and back home to Earth, the Earth

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00:04:39,890 --> 00:04:45,379
the Magellan experienced, can be now experienced from space in the same way that

58
00:04:45,570 --> 00:04:49,640
Magellan experienced sailing it. From the record of biology on Earth and

59
00:04:49,980 --> 00:04:55,819
circulation and energy we can come home to the Iberian Peninsula where Magellan set sail

60
00:04:56,340 --> 00:05:03,470
500 years ago and today thanks to Jose Marques and his team we commemorate the 500th anniversary of our

61
00:05:04,140 --> 00:05:10,849
oceanic exploration that carries us forward today to the exploration of deep space the forever frontier.