



1  
00:00:19,970 --> 00:00:17,630  
in recent years NASA shuttle fleet has

2  
00:00:22,640 --> 00:00:19,980  
launched a trio spacecraft beginning a

3  
00:00:25,880 --> 00:00:22,650  
second phase of robotic exploration of

4  
00:00:28,519 --> 00:00:25,890  
our solar system initially sent to every

5  
00:00:30,529 --> 00:00:28,529  
planet except Pluto their travels

6  
00:00:33,799 --> 00:00:30,539  
confirmed planetary atmospheres

7  
00:00:37,310 --> 00:00:33,809  
reminiscent of early Earth evidence of

8  
00:00:40,369 --> 00:00:37,320  
water active volcanoes planetary rings

9  
00:00:43,490 --> 00:00:40,379  
and even giant storms were discovered

10  
00:00:47,440 --> 00:00:43,500  
the new phase of exploration provides

11  
00:00:50,869 --> 00:00:47,450  
even more in-depth studies in October

12  
00:00:53,779 --> 00:00:50,879  
1990 the Ulysses spacecraft began a

13  
00:00:56,119 --> 00:00:53,789

five-year journey it was built by the

14

00:00:59,540 --> 00:00:56,129

European Space Agency to learn more

15

00:01:01,299 --> 00:00:59,550

about the Sun Jupiter is the ultimate

16

00:01:05,590 --> 00:01:01,309

destination for NASA's Galileo

17

00:01:08,660 --> 00:01:05,600

spacecraft launched in October 1989

18

00:01:12,710 --> 00:01:08,670

after reaching the giant gaseous planet

19

00:01:14,929 --> 00:01:12,720

in late 1995 Galileo would deploy a tiny

20

00:01:18,289 --> 00:01:14,939

probe to penetrate the atmosphere and

21

00:01:20,390 --> 00:01:18,299

radio back data at the same time the

22

00:01:22,670 --> 00:01:20,400

main orbiter will use its complement of

23

00:01:26,120 --> 00:01:22,680

12 experiments to study Jupiter's

24

00:01:29,539 --> 00:01:26,130

sixteen moons its atmosphere radiation

25

00:01:32,210 --> 00:01:29,549

and magnetic fields traveling to Jupiter

26  
00:01:34,670 --> 00:01:32,220  
requires a series of gravity assists

27  
00:01:37,310 --> 00:01:34,680  
giving the spacecraft to push by

28  
00:01:40,550 --> 00:01:37,320  
visiting Venus once then earth twice

29  
00:01:43,160 --> 00:01:40,560  
before making the final leg to Jupiter

30  
00:01:45,679 --> 00:01:43,170  
this is what Galileo saw when it

31  
00:01:48,710 --> 00:01:45,689  
recently came within 600 miles of Earth

32  
00:01:52,010 --> 00:01:48,720  
on its first pass hundreds of images

33  
00:01:54,380 --> 00:01:52,020  
were combined over a 25 hour period to

34  
00:01:57,529 --> 00:01:54,390  
give a view never seen before of the

35  
00:01:59,929 --> 00:01:57,539  
whole earth in motion images of the moon

36  
00:02:03,560 --> 00:01:59,939  
were also taken which include rare

37  
00:02:06,590 --> 00:02:03,570  
glimpses of its far side Earth's sister

38  
00:02:09,589 --> 00:02:06,600

planet Venus is similar in size density

39

00:02:12,160 --> 00:02:09,599

and position in the solar system but

40

00:02:14,900 --> 00:02:12,170

very different in geology and climate

41

00:02:18,860 --> 00:02:14,910

making it an important candidate for

42

00:02:20,870 --> 00:02:18,870

study in May of 1989 the Atlantis

43

00:02:23,600 --> 00:02:20,880

shuttle poll released the spacecraft

44

00:02:27,080 --> 00:02:23,610

Magellan on a mission to map the entire

45

00:02:29,199 --> 00:02:27,090

surface of Venus the elegant yet simple

46

00:02:31,880 --> 00:02:29,209

mapper carries one instrument a

47

00:02:33,680 --> 00:02:31,890

high-resolution radar that sees through

48

00:02:36,470 --> 00:02:33,690

the planet's thick cloud choked

49

00:02:38,449 --> 00:02:36,480

atmosphere mapping has just begun at

50

00:02:41,660 --> 00:02:38,459

NASA's Jet Propulsion Laboratory in

51  
00:02:44,270 --> 00:02:41,670  
Pasadena California investigators like

52  
00:02:46,759 --> 00:02:44,280  
dr. Jim head a geologist at Brown

53  
00:02:48,949 --> 00:02:46,769  
University are already seeing features

54  
00:02:51,410 --> 00:02:48,959  
that set this planet apart from all

55  
00:02:53,930 --> 00:02:51,420  
others the detail of the Magellan images

56  
00:02:55,310 --> 00:02:53,940  
and their crispness is so incredibly

57  
00:02:57,050 --> 00:02:55,320  
it's these are these are just like

58  
00:02:59,870 --> 00:02:57,060  
pieces of art you know we sit and we

59  
00:03:02,690 --> 00:02:59,880  
look at these almost an AW some raw data

60  
00:03:04,670 --> 00:03:02,700  
has also been processed into movies that

61  
00:03:06,920 --> 00:03:04,680  
bring out the desolate lava-filled

62  
00:03:11,000 --> 00:03:06,930  
landscape making up so much of the

63  
00:03:13,009 --> 00:03:11,010

Venusian surface old areas unspoiled by

64

00:03:14,870 --> 00:03:13,019

lava flows are intriguing to

65

00:03:17,990 --> 00:03:14,880

investigators because they show little

66

00:03:19,640 --> 00:03:18,000

sign of being eroded if you said to

67

00:03:22,009 --> 00:03:19,650

someone gee you know we have this planet

68

00:03:23,479 --> 00:03:22,019

here that has this incredibly hot dense

69

00:03:25,580 --> 00:03:23,489

atmosphere and by the way it sort of

70

00:03:27,530 --> 00:03:25,590

rained sulfuric acid and so on

71

00:03:29,360 --> 00:03:27,540

you know you get this vision of things

72

00:03:31,099 --> 00:03:29,370

are rotating away completely and no

73

00:03:33,080 --> 00:03:31,109

record of anything but it's quite to the

74

00:03:35,870 --> 00:03:33,090

contrary in fact the very dense

75

00:03:38,539 --> 00:03:35,880

atmosphere keeps these small projectiles

76  
00:03:39,979 --> 00:03:38,549  
that would come in from outer space off

77  
00:03:42,020 --> 00:03:39,989  
the surface and the very high surface

78  
00:03:43,670 --> 00:03:42,030  
temperatures mean that there's no liquid

79  
00:03:47,240 --> 00:03:43,680  
water and we're able to look at the

80  
00:03:49,039 --> 00:03:47,250  
surface and see an crisp rich detail the

81  
00:03:50,720 --> 00:03:49,049  
nature of the geological processes that

82  
00:03:52,130 --> 00:03:50,730  
are operating much more so than we're

83  
00:03:54,680 --> 00:03:52,140  
able to do on the earth

84  
00:03:56,990 --> 00:03:54,690  
in the coming years as the United States

85  
00:03:59,960 --> 00:03:57,000  
and its international partners continue

86  
00:04:03,200 --> 00:03:59,970  
planetary exploration the spacecraft

87  
00:04:06,020 --> 00:04:03,210  
Ulysses Galileo and Magellan will play