
VENUS CLOUD MOTIONS

1
00:00:16,730 --> 00:00:13,340
this much we can say at this moment the

2
00:00:18,769 --> 00:00:16,740
planet Venus is a very hot planet the

3
00:00:24,960 --> 00:00:18,779
atmosphere is dense as primary

4
00:00:29,850 --> 00:00:26,640
there are many mysteries yet remaining

5
00:00:32,310 --> 00:00:29,860
about the planet Venus these mysteries

6
00:00:34,560 --> 00:00:32,320
will be solved by further analysis by

7
00:00:47,300 --> 00:00:34,570
present data and hopefully by more

8
00:00:53,180 --> 00:00:49,910
NASA the National Aeronautics and Space

9
00:01:01,580 --> 00:00:53,190
Administration presents Aeronautics and

10
00:01:04,010 --> 00:01:01,590
Space report next month NASA plans to

11
00:01:05,960 --> 00:01:04,020
launch an unmanned Mariner spacecraft to

12
00:01:07,910 --> 00:01:05,970
the planet Venus we know very little

13
00:01:11,300 --> 00:01:07,920

about Venus because we cannot see

14
00:01:13,250 --> 00:01:11,310
through its thick clouds the 540 pound

15
00:01:15,380 --> 00:01:13,260
Mariner will attempt to shed light on

16
00:01:17,300 --> 00:01:15,390
the origin and nature of the planet and

17
00:01:30,200 --> 00:01:17,310
its environment giving us additional

18
00:01:31,880 --> 00:01:30,210
knowledge about our solar system ever

19
00:01:33,950 --> 00:01:31,890
since the first people were gazing up at

20
00:01:39,499 --> 00:01:33,960
the skies they had to have noticed Venus

21
00:01:41,210 --> 00:01:39,509
it's so incredibly bright in ancient

22
00:01:43,070 --> 00:01:41,220
records at the Mayans the Greeks the

23
00:01:45,440 --> 00:01:43,080
Chinese people all over the world were

24
00:01:47,359 --> 00:01:45,450
seeing Venus up there mania and writing

25
00:01:49,520 --> 00:01:47,369
all sorts of stories about it but we

26
00:01:51,889 --> 00:01:49,530
could say that first modern observations

27
00:01:57,340 --> 00:01:51,899
of Venus began with the use of the

28
00:02:04,280 --> 00:02:01,310
Galileo in the early 1600s turned his

29
00:02:06,889 --> 00:02:04,290
telescope on to Venus and he looked at

30
00:02:09,350 --> 00:02:06,899
the phases of Venus and that really

31
00:02:12,320 --> 00:02:09,360
refuted the geocentric model that was in

32
00:02:14,839 --> 00:02:12,330
play and commonly accepted Galileo's

33
00:02:16,790 --> 00:02:14,849
observations were one of the first clear

34
00:02:25,400 --> 00:02:16,800
examples of how observing another world

35
00:02:26,660 --> 00:02:25,410
could tell you about your own for the

36
00:02:28,789 --> 00:02:26,670
next 300 years

37
00:02:31,820 --> 00:02:28,799
Venus continued to be an obvious target

38
00:02:33,620 --> 00:02:31,830

for telescopes these early observations

39
00:02:36,680 --> 00:02:33,630
eventually revealed that Venus had a

40
00:02:38,750 --> 00:02:36,690
thick dense atmosphere this discovery

41
00:02:41,150 --> 00:02:38,760
would define our image of the planet

42
00:02:43,640 --> 00:02:41,160
rather than seeing it as a meandering

43
00:02:50,890 --> 00:02:43,650
bright star Venus was now our mysterious

44
00:02:56,270 --> 00:02:54,290
early in the 20th century or making huge

45
00:02:59,960 --> 00:02:56,280
advances in science and all kinds of

46
00:03:02,509 --> 00:02:59,970
different fields with advances we start

47
00:03:04,759 --> 00:03:02,519
getting observations of Venus using

48
00:03:07,820 --> 00:03:04,769
spectroscopy and using ultraviolet

49
00:03:10,570 --> 00:03:07,830
wavelengths the astronomers of the time

50
00:03:12,860 --> 00:03:10,580
will make it fairly reasonable

51
00:03:15,350 --> 00:03:12,870
assumptions that the atmosphere on Venus

52
00:03:17,240 --> 00:03:15,360
is very similar to the moment earth and

53
00:03:20,800 --> 00:03:17,250
that the clouds that they were observing

54
00:03:22,880 --> 00:03:20,810
war made up of water vapour and

55
00:03:25,009 --> 00:03:22,890
subsequently they concluded that the

56
00:03:28,910 --> 00:03:25,019
Phoenician atmosphere was really wet and

57
00:03:31,670 --> 00:03:28,920
stormy and the service was swarming and

58
00:03:33,800 --> 00:03:31,680
a lot of astronomers at the time even

59
00:03:36,710 --> 00:03:33,810
concluded that that was really good

60
00:03:39,020 --> 00:03:36,720
conditions for life there's never been

61
00:03:40,119 --> 00:03:39,030
anything like this before in fact or

62
00:03:52,090 --> 00:03:40,129
picture

63
00:03:57,440 --> 00:03:54,650

NASA's Mariner spacecraft after

64
00:03:59,900 --> 00:03:57,450
traveling for months and 217 million

65
00:04:06,680 --> 00:03:59,910
miles began fulfilling its mission as it

66
00:04:09,110 --> 00:04:06,690
rendezvous with the planet Venus by 1967

67
00:04:12,800 --> 00:04:09,120
we actually had two successful missions

68
00:04:15,290 --> 00:04:12,810
make it to Venus the first one was the

69
00:04:17,900 --> 00:04:15,300
Soviet Venera four and nearly a month

70
00:04:21,320 --> 00:04:17,910
late it was followed up by the NASA's

71
00:04:23,330 --> 00:04:21,330
Mariner 5 the interesting thing about

72
00:04:27,770 --> 00:04:23,340
that that we were in the middle of the

73
00:04:29,810 --> 00:04:27,780
Cold War and despite that the Soviet and

74
00:04:32,650 --> 00:04:29,820
American scientists were working

75
00:04:35,270 --> 00:04:32,660
together cooperated shared the data and

76
00:04:38,840 --> 00:04:35,280
the picture that the scientists god of

77
00:04:43,250 --> 00:04:38,850
dienes was much more inhospitable than

78
00:04:45,470 --> 00:04:43,260
they really imagined by 1967 if there

79
00:04:48,200 --> 00:04:45,480
were any doubts about whether Venus was

80
00:04:54,409 --> 00:04:48,210
livable or not those doubts were washed

81
00:04:59,550 --> 00:04:57,390
now in an unexplored region of space

82
00:05:01,619 --> 00:04:59,560
Mariner was placed on its mercury

83
00:05:04,320 --> 00:05:01,629
intercept course by the gravity of Venus

84
00:05:09,240 --> 00:05:04,330
the initial target on this first dual

85
00:05:11,520 --> 00:05:09,250
planet mission Mariner 10 took more than

86
00:05:19,189 --> 00:05:11,530
3,500 pictures during its rendezvous

87
00:05:23,929 --> 00:05:21,200
for the first time after a decade of

88
00:05:26,360 --> 00:05:23,939

exploration Mariner 10 was carrying

89
00:05:27,739 --> 00:05:26,370
cameras we had ultraviolet cameras we

90
00:05:29,510 --> 00:05:27,749
could actually make some of the most

91
00:05:32,149 --> 00:05:29,520
beautiful images I mean here we have

92
00:05:34,070 --> 00:05:32,159
Venus the goddess of love and beauty and

93
00:06:02,260 --> 00:05:34,080
we had yet to really make a close-up

94
00:06:07,909 --> 00:06:05,779
pioneer Venus was the last NASA mission

95
00:06:10,309 --> 00:06:07,919
to go to Venus to study specifically its

96
00:06:13,219 --> 00:06:10,319
atmosphere in detail in the dynamics of

97
00:06:18,080 --> 00:06:13,229
that atmosphere that was 30 years ago

98
00:06:21,610 --> 00:06:18,090
that we send it there it took a lot of

99
00:06:24,260 --> 00:06:21,620
detailed data that allowed us to test

100
00:06:27,170 --> 00:06:24,270
the theories that we had about why Venus

101
00:06:28,520 --> 00:06:27,180
was such a strange environment and one

102
00:06:30,409 --> 00:06:28,530
of the most interesting of course is

103
00:06:33,010 --> 00:06:30,419
this idea of the runaway greenhouse

104
00:06:44,839 --> 00:06:33,020
effect as an explanation for why is

105
00:06:48,230 --> 00:06:44,849
Venus so super hot so while the Pioneer

106
00:06:50,869 --> 00:06:48,240
Venus orbiter was sending a steady

107
00:06:53,149 --> 00:06:50,879
stream of data back to earth the Soviet

108
00:06:55,580 --> 00:06:53,159
program undertook several more eight

109
00:06:57,499 --> 00:06:55,590
missions back to Venice and the

110
00:07:00,740 --> 00:06:57,509
highlight of this set of missions was

111
00:07:02,839 --> 00:07:00,750
Venera 13 and 14 which made it to the

112
00:07:05,899 --> 00:07:02,849
surface of Venice and while they will

113
00:07:08,089 --> 00:07:05,909

act today for 45 minutes they took a

114
00:07:12,019 --> 00:07:08,099
handful of color panoramas for the

115
00:07:15,860 --> 00:07:12,029
Venetian surface now that they have been

116
00:07:18,950 --> 00:07:15,870
reprocessed they present a stunning view

117
00:07:22,310 --> 00:07:18,960
of the Venus surface

118
00:07:23,810 --> 00:07:22,320
and forgetting the heat toxic atmosphere

119
00:07:32,040 --> 00:07:23,820
and the pressure

120
00:07:37,360 --> 00:07:35,020
Venis the brightest star in the evening

121
00:07:42,790 --> 00:07:37,370
sky has captured our imaginations for

122
00:07:45,040 --> 00:07:42,800
centuries since August of 1990 though a

123
00:07:47,560 --> 00:07:45,050
spacecraft named Magellan has peered

124
00:07:49,510 --> 00:07:47,570
beneath this veil of mystery to show us

125
00:07:59,050 --> 00:07:49,520
the surface of Venus in unsurpassed

126
00:08:01,750 --> 00:07:59,060
detail Magellan was a pretty simple and

127
00:08:05,140 --> 00:08:01,760
elegant mission and had one basic

128
00:08:07,480 --> 00:08:05,150
purpose and that was to get a detailed

129
00:08:10,690 --> 00:08:07,490
high-resolution map of the surface

130
00:08:13,030 --> 00:08:10,700
topography of the entire planet and what

131
00:08:16,420 --> 00:08:13,040
we saw was was an enormous surprise a

132
00:08:19,180 --> 00:08:16,430
very young surface lots of volcanic

133
00:08:22,300 --> 00:08:19,190
features there were lava planes and

134
00:08:24,310 --> 00:08:22,310
volcanoes and all kinds of features it

135
00:08:26,770 --> 00:08:24,320
was an unexpected and marvelous

136
00:08:34,279 --> 00:08:26,780
revelation of what was underneath those

137
00:08:40,380 --> 00:08:38,190
at this point the american-soviet space

138
00:08:43,110 --> 00:08:40,390

missions are really museum pieces and

139
00:08:45,510 --> 00:08:43,120
while everybody is now excited about the

140
00:08:48,270 --> 00:08:45,520
new data and the new pictures images

141
00:08:51,050 --> 00:08:48,280
that we are getting from Mars Venice is

142
00:08:55,680 --> 00:08:51,060
really staying in the shadow right now

143
00:08:58,560 --> 00:08:55,690
but throughout the history Venus has

144
00:09:01,800 --> 00:08:58,570
provided us a lot of wonderful and

145
00:09:04,110 --> 00:09:01,810
interesting theories and answers to the

146
00:09:07,110 --> 00:09:04,120
questions that we have here on earth and

147
00:09:11,820 --> 00:09:07,120
which shone the light on now space in

148
00:09:13,590 --> 00:09:11,830
the universe but new players are coming

149
00:09:16,260 --> 00:09:13,600
into the game and with the European

150
00:09:19,830 --> 00:09:16,270
Space Agency sending a spacecraft there

151
00:09:24,330 --> 00:09:19,840
in 2006 and the Japanese space agency

152
00:09:27,060 --> 00:09:24,340
planning one in 2010 the Venice

153
00:09:29,640 --> 00:09:27,070
exploration is going to pick up and it

154
00:09:31,860 --> 00:09:29,650
really seems that a very good

155
00:09:33,810 --> 00:09:31,870
opportunity to go back because there are

156
00:09:38,070 --> 00:09:33,820
lots of things that we still don't know

157
00:09:41,790 --> 00:09:38,080
and with nearly two decades passed from