
science @ NASA

1
00:00:09,830 --> 00:00:06,470
watch out for the blue moon

2
00:00:12,150 --> 00:00:09,840
presented by science at nasa

3
00:00:13,910 --> 00:00:12,160
when someone says once in a blue moon

4
00:00:14,910 --> 00:00:13,920
you know what they mean

5
00:00:17,510 --> 00:00:14,920
rare

6
00:00:20,630 --> 00:00:17,520
seldom even absurd

7
00:00:22,870 --> 00:00:20,640
this year it means august 31st

8
00:00:24,950 --> 00:00:22,880
for the second time this month the moon

9
00:00:27,670 --> 00:00:24,960
is about to become full

10
00:00:29,669 --> 00:00:27,680
there was one full moon on august 1st

11
00:00:31,349 --> 00:00:29,679
and now a second is coming on august

12
00:00:33,510 --> 00:00:31,359
31st

13
00:00:35,270 --> 00:00:33,520

according to modern folklore whenever

14
00:00:38,389 --> 00:00:35,280
there are two full moons in a calendar

15
00:00:40,790 --> 00:00:38,399
month the second one is blue

16
00:00:43,030 --> 00:00:40,800
cue up the elvis records

17
00:00:46,389 --> 00:00:43,040
in song and literature blue moons have

18
00:00:47,990 --> 00:00:46,399
long symbolized lost love and melancholy

19
00:00:51,830 --> 00:00:48,000
elvis set the standard for lunar

20
00:00:54,229 --> 00:00:51,840
heartbreak in his 1956 pop hit blue moon

21
00:00:56,150 --> 00:00:54,239
but will the moody moon of august 31st

22
00:00:59,590 --> 00:00:56,160
actually turn blue

23
00:01:01,750 --> 00:00:59,600
probably not most blue moons look pale

24
00:01:04,070 --> 00:01:01,760
gray and white indistinguishable from

25
00:01:05,750 --> 00:01:04,080
any other moon you've ever seen

26
00:01:07,270 --> 00:01:05,760
squeezing a second full moon into a

27
00:01:09,590 --> 00:01:07,280
calendar month doesn't change the

28
00:01:12,789 --> 00:01:09,600
physical properties of the moon itself

29
00:01:15,270 --> 00:01:12,799
so its color remains the same with that

30
00:01:18,070 --> 00:01:15,280
caveat in mind however be aware that on

31
00:01:20,310 --> 00:01:18,080
rare occasions it can happen

32
00:01:21,990 --> 00:01:20,320
a truly blue moon usually requires a

33
00:01:25,030 --> 00:01:22,000
volcanic eruption

34
00:01:26,950 --> 00:01:25,040
back in 1883 for example people saw blue

35
00:01:29,510 --> 00:01:26,960
moons almost every night after the

36
00:01:31,910 --> 00:01:29,520
indonesian volcano krakatoa exploded

37
00:01:33,350 --> 00:01:31,920
with the force of a 100 megaton nuclear

38
00:01:35,670 --> 00:01:33,360

bomb

39
00:01:38,469 --> 00:01:35,680
600 kilometers away people heard the

40
00:01:40,310 --> 00:01:38,479
noise as loud as a cannon shot plumes of

41
00:01:42,310 --> 00:01:40,320
ash rose to the very top of earth's

42
00:01:43,910 --> 00:01:42,320
atmosphere and the moon

43
00:01:46,630 --> 00:01:43,920
it turned blue

44
00:01:48,230 --> 00:01:46,640
krakatoa's ash was the reason

45
00:01:51,030 --> 00:01:48,240
some of the ash clouds were filled with

46
00:01:53,590 --> 00:01:51,040
particles one micron wide about the same

47
00:01:55,990 --> 00:01:53,600
as the wavelength of red light

48
00:01:57,990 --> 00:01:56,000
particles of this special size strongly

49
00:01:59,910 --> 00:01:58,000
scatter red light while allowing blue

50
00:02:02,469 --> 00:01:59,920
light to pass through

51
00:02:04,230 --> 00:02:02,479
krakatoa's clouds thus acted like a blue

52
00:02:06,310 --> 00:02:04,240
filter

53
00:02:08,710 --> 00:02:06,320
people also saw blue colored moons in

54
00:02:11,110 --> 00:02:08,720
1983 after the eruption of the al

55
00:02:13,030 --> 00:02:11,120
chichon volcano in mexico

56
00:02:15,910 --> 00:02:13,040
and there are reports of blue moons

57
00:02:19,589 --> 00:02:15,920
caused by mount saint helens in 1980

58
00:02:21,430 --> 00:02:19,599
and mount pinatuba in 1991.

59
00:02:22,869 --> 00:02:21,440
certain forest fires can perform the

60
00:02:25,030 --> 00:02:22,879
same trick

61
00:02:28,710 --> 00:02:25,040
a famous example is the giant muskeg

62
00:02:30,790 --> 00:02:28,720
fire of september 1953 in alberta canada

63
00:02:33,190 --> 00:02:30,800

clouds of smoke containing micron sized

64
00:02:34,949 --> 00:02:33,200
oil droplets produced lavender suns and

65
00:02:37,110 --> 00:02:34,959
blue moons all the way from north

66
00:02:39,110 --> 00:02:37,120
america to england

67
00:02:41,430 --> 00:02:39,120
there are plenty of wildfires burning in

68
00:02:43,110 --> 00:02:41,440
the hot dry usa this month

69
00:02:45,750 --> 00:02:43,120
if any of them produce smoke with an

70
00:02:48,949 --> 00:02:45,760
extra dose of micron-sized particles the

71
00:02:52,470 --> 00:02:48,959
full moon might really turn blue

72
00:02:54,630 --> 00:02:52,480
on the other hand maybe it will turn red

73
00:02:56,309 --> 00:02:54,640
often when the moon is hanging low it

74
00:02:57,990 --> 00:02:56,319
looks red for the same reason that

75
00:03:00,070 --> 00:02:58,000
sunsets are red

76
00:03:01,589 --> 00:03:00,080
the atmosphere is full of aerosols much

77
00:03:03,030 --> 00:03:01,599
smaller than the ones injected by

78
00:03:05,350 --> 00:03:03,040
volcanoes

79
00:03:07,589 --> 00:03:05,360
measuring less than a micron in diameter

80
00:03:09,910 --> 00:03:07,599
these aerosols scatter blue light while

81
00:03:11,190 --> 00:03:09,920
leaving the red behind

82
00:03:13,830 --> 00:03:11,200
for this reason

83
00:03:16,149 --> 00:03:13,840
red blue moons are far more common than

84
00:03:17,670 --> 00:03:16,159
blue blue moons

85
00:03:18,550 --> 00:03:17,680
sounds absurd

86
00:03:21,190 --> 00:03:18,560
yes

87
00:03:24,070 --> 00:03:21,200
but that's what a blue moon is all about

88
00:03:26,229 --> 00:03:24,080

step outside at sunset on august 31st

89
00:03:28,470 --> 00:03:26,239
look east at the moon rise and see what

90
00:03:31,589 --> 00:03:28,480
color presents itself

91
00:03:32,550 --> 00:03:31,599
for more news about moons big blue and