

1  
00:00:06,639 --> 00:00:14,359  
comets are scary-looking things seeing

2  
00:00:11,779 --> 00:00:16,489  
them up there their long tails sprayed

3  
00:00:14,359 --> 00:00:19,039  
across the pristine calm of our night

4  
00:00:16,489 --> 00:00:21,169  
sky it's easy to understand how they

5  
00:00:19,039 --> 00:00:25,369  
have terrorized our imaginations for so

6  
00:00:21,170 --> 00:00:28,039  
long for centuries humanity is worried

7  
00:00:25,370 --> 00:00:30,650  
where do they come from are they going

8  
00:00:28,039 --> 00:00:33,649  
to hurt us why do they appear gradually

9  
00:00:30,649 --> 00:00:38,570  
getting larger and larger will they

10  
00:00:33,649 --> 00:00:41,600  
leave us alone sometimes comets do hit

11  
00:00:38,570 --> 00:00:44,030  
the earth Earth's history is full of

12  
00:00:41,600 --> 00:00:46,789  
comet impacts huge collisions that have

13  
00:00:44,030 --> 00:00:48,319  
changed the nature of our planet these

14  
00:00:46,789 --> 00:00:50,629  
collisions would have brought terrible

15  
00:00:48,319 --> 00:00:52,940  
destruction but they're also credited

16  
00:00:50,628 --> 00:00:57,378  
with bringing water and other essential

17  
00:00:52,939 --> 00:01:00,289  
elements for life to earth why do they

18  
00:00:57,378 --> 00:01:02,599  
hit us well that depends on what type of

19  
00:01:00,289 --> 00:01:04,969  
comment we're talking about there are

20  
00:01:02,600 --> 00:01:09,230  
two main types of comments characterized

21  
00:01:04,969 --> 00:01:11,269  
primarily by where they come from comets

22  
00:01:09,230 --> 00:01:15,189  
usually originate in one of two places

23  
00:01:11,269 --> 00:01:17,689  
the Kuiper belt or be a word cloud

24  
00:01:15,189 --> 00:01:19,909  
comets from the Kuiper belt are short

25  
00:01:17,689 --> 00:01:22,489  
period comets that follow orbits around

26  
00:01:19,909 --> 00:01:26,359  
the Sun and make repeat visits to our

27  
00:01:22,489 --> 00:01:28,939  
night sky comet Halley is like this it

28  
00:01:26,359 --> 00:01:32,299  
becomes visible from Earth every 75 to

29

00:01:28,939 --> 00:01:35,539  
76 years most of these comets return

30  
00:01:32,299 --> 00:01:38,149  
within 20 years or less the most

31  
00:01:35,540 --> 00:01:41,750  
dangerous war become from the second

32  
00:01:38,150 --> 00:01:43,700  
type a long period comet these celestial

33  
00:01:41,750 --> 00:01:45,769  
bodies originate from the outer edges of

34  
00:01:43,700 --> 00:01:48,950  
the solar system beyond the orbit of

35  
00:01:45,769 --> 00:01:50,719  
Neptune these long period comets are

36  
00:01:48,950 --> 00:01:53,469  
gravitationally kicked out of their safe

37  
00:01:50,719 --> 00:01:56,510  
orbits tucked far away in the Oort cloud

38  
00:01:53,469 --> 00:02:00,289  
they then form highly elongated orbits

39  
00:01:56,510 --> 00:02:03,240  
that pass across the path of the planets

40  
00:02:00,290 --> 00:02:06,090  
long period comets follow parabolic and

41  
00:02:03,239 --> 00:02:07,949  
sometimes hyperbolic trajectories these

42  
00:02:06,090 --> 00:02:09,780  
are the most dangerous to the earth has

43  
00:02:07,950 --> 00:02:12,240

their paths and inclinations are the

44

00:02:09,780 --> 00:02:14,909

most extreme these are the comas to

45

00:02:12,240 --> 00:02:18,900

keep your eyes on and in September 2012

46

00:02:14,909 --> 00:02:20,759

we found one we call it comet Ison after

47

00:02:18,900 --> 00:02:22,950

the Russian Observatory known as the

48

00:02:20,759 --> 00:02:26,549

international scientific optical network

49

00:02:22,949 --> 00:02:28,769

that discovered it this chunk of ice and

50

00:02:26,550 --> 00:02:33,060

rock a few kilometers across was found

51

00:02:28,770 --> 00:02:34,590

using only a 40 centimeter telescope its

52

00:02:33,060 --> 00:02:37,590

orbit has been measured and is probably

53

00:02:34,590 --> 00:02:40,050

parabolic meaning Ison is a long period

54

00:02:37,590 --> 00:02:42,900

comet and it will pass extremely close

55

00:02:40,050 --> 00:02:45,000

to the Sun the parabolic orbit indicates

56

00:02:42,900 --> 00:02:49,099

that this is probably Comet Ison's first

57

00:02:45,000 --> 00:02:49,099

pass ever through our solar system

58  
00:02:49,729 --> 00:02:54,318  
a regardless of whether it has a

59  
00:02:51,590 --> 00:02:57,769  
hyperbolic or parabolic orbit one

60  
00:02:54,318 --> 00:03:01,639  
question looms large will comet ison

61  
00:02:57,769 --> 00:03:02,780  
actually hit the earth current

62  
00:03:01,639 --> 00:03:05,029  
projections of the Comets trajectory

63  
00:03:02,780 --> 00:03:09,019  
show it will reach its closest approach

64  
00:03:05,030 --> 00:03:12,169  
to earth on December 26 2013 where it

65  
00:03:09,019 --> 00:03:15,860  
will pass no closer and 63 million

66  
00:03:12,169 --> 00:03:18,429  
kilometers overhead so it appears the

67  
00:03:15,860 --> 00:03:22,549  
earth will get a pass on this one

68  
00:03:18,430 --> 00:03:24,920  
however in January 2014 the earth will

69  
00:03:22,549 --> 00:03:27,019  
swing past a part of space that comet

70  
00:03:24,919 --> 00:03:30,098  
Ison already traveled through at a

71  
00:03:27,019 --> 00:03:32,689  
distance of only 4.4 million kilometers

72  
00:03:30,098 --> 00:03:35,598  
this encounter brings up the possibility

73  
00:03:32,689 --> 00:03:36,739  
of a meteor shower on earth meteor

74  
00:03:35,598 --> 00:03:39,318  
showers occur when the Earth passes

75  
00:03:36,739 --> 00:03:42,579  
through the dust left behind by comets

76  
00:03:39,318 --> 00:03:45,318  
usually by recurring short period ones

77  
00:03:42,579 --> 00:03:49,420  
meteor showers from long period Oort

78  
00:03:45,318 --> 00:03:52,219  
cloud comets are rare events indeed

79  
00:03:49,419 --> 00:03:55,099  
there will be plenty of opportunity for

80  
00:03:52,219 --> 00:03:58,400  
surprises as comet Ison begins to appear

81  
00:03:55,099 --> 00:04:02,079  
in our night sky but hitting the earth

82  
00:03:58,400 --> 00:04:02,079  
won't be one of them

83  
00:04:04,520 --> 00:04:06,580  
you