1
00:00:07,990 --> 00:00:06,470
wise is the wide field infrared survey

2
00:00:09,750 --> 00:00:08,000
explorer

3
00:00:11,509 --> 00:00:09,760
wise is going to find hundreds of

4
00:00:13,910 --> 00:00:11,519
millions of objects spread over the

5
00:00:15,270 --> 00:00:13,920
entire sky and for us that's like a

6
00:00:16,950 --> 00:00:15,280
treasure map

7
00:00:19,029 --> 00:00:16,960
we think there are about as many grains

8
00:00:21,590 --> 00:00:19,039
of sand on this beach as there are stars

9
00:00:23,349 --> 00:00:21,600
in the entire universe so the task of

10
00:00:25,189 --> 00:00:23,359
finding rare objects in the universe

11
00:00:27,189 --> 00:00:25,199
that we're interested in requires the

12
00:00:28,550 --> 00:00:27,199
maps that wise is going to make

13
00:00:31,029 --> 00:00:28,560

it's a bit like using this metal

14
00:00:34,069 --> 00:00:31,039
detector here to try to find gold coins

15
00:00:36,069 --> 00:00:34,079
that are buried in all of this sand

16
00:00:37,990 --> 00:00:36,079
wise consists of a fairly modest size

17
00:00:40,069 --> 00:00:38,000
telescope about 40 centimeters in

18
00:00:42,069 --> 00:00:40,079
diameter that would sort of fit under

19
00:00:44,389 --> 00:00:42,079
your arm

20
00:00:46,549 --> 00:00:44,399
wise is going to survey the entire sky

21
00:00:49,029 --> 00:00:46,559
in four infrared wavelengths over six

22
00:00:52,549 --> 00:00:50,630
all sky surveys are one of the basic

23
00:00:54,709 --> 00:00:52,559
tools that astronomers use to find

24
00:00:59,110 --> 00:00:54,719
interesting and unusual objects it's

25
00:01:00,549 --> 00:00:59,120
sort of like the gps of astronomy

26
00:01:02,229 --> 00:01:00,559
one of the most exciting things that you

27
00:01:05,109 --> 00:01:02,239
expect to find with an all sky survey

28
00:01:07,350 --> 00:01:05,119
likewise is the unexpected we expect

29
00:01:10,630 --> 00:01:07,360
surprises things that we have no idea

30
00:01:13,990 --> 00:01:12,230
one of the projects wise is going to be

31
00:01:16,390 --> 00:01:14,000
doing is studying the population of

32
00:01:18,070 --> 00:01:16,400
near-earth objects these are asteroids

33
00:01:19,510 --> 00:01:18,080
and comets whose orbits get close to

34
00:01:20,710 --> 00:01:19,520
earth's orbit now this doesn't

35
00:01:22,550 --> 00:01:20,720
necessarily mean that they're going to

36
00:01:24,630 --> 00:01:22,560
hit the earth but we do want to pay some

37
00:01:26,070 --> 00:01:24,640
attention to them with wise we'll be

38
00:01:27,830 --> 00:01:26,080

able to tell something about how many

39
00:01:29,910 --> 00:01:27,840
there are what their sizes are and what

40
00:01:31,990 --> 00:01:29,920
they're made out of whether they're soft

41
00:01:35,510 --> 00:01:32,000
and crumbly like this ball of sand or

42
00:01:37,429 --> 00:01:35,520
solid rock like this rock right here

43
00:01:39,109 --> 00:01:37,439
in visible light an object that's small

44
00:01:41,030 --> 00:01:39,119
and shiny reflects the same amount of

45
00:01:41,910 --> 00:01:41,040
sunlight as an asteroid that's big and

46
00:01:43,190 --> 00:01:41,920
dark

47
00:01:44,950 --> 00:01:43,200
but when we look with an infrared

48
00:01:47,030 --> 00:01:44,960
telescope we're seeing heat that's

49
00:01:48,870 --> 00:01:47,040
emitted from more sides of the asteroid

50
00:01:50,469 --> 00:01:48,880
so we get a much better true measurement

51
00:01:52,149 --> 00:01:50,479
of the object's size

52
00:01:53,429 --> 00:01:52,159
and this is important because it allows

53
00:01:55,190 --> 00:01:53,439
us to tell whether or not we're dealing

54
00:01:59,910 --> 00:01:55,200
with an object that's this big or an

55
00:02:03,350 --> 00:02:01,350
the maps that wise is going to be

56
00:02:05,830 --> 00:02:03,360
generating can be used to find all sorts

57
00:02:07,749 --> 00:02:05,840
of rare and unusual objects one of these

58
00:02:10,070 --> 00:02:07,759
objects is the most luminous galaxy in

59
00:02:12,229 --> 00:02:10,080
the entire universe

60
00:02:14,630 --> 00:02:12,239
but finding it is about like trying to

61
00:02:21,110 --> 00:02:14,640
find one particular grain of sand on

62
00:02:24,869 --> 00:02:22,869
one of the other rare types of objects

63
00:02:26,869 --> 00:02:24,879

that wives may find is possibly the

64
00:02:28,550 --> 00:02:26,879
nearest star to our sun

65
00:02:30,309 --> 00:02:28,560
we think that there's a good chance that

66
00:02:31,990 --> 00:02:30,319
our sun actually does have a closer

67
00:02:33,910 --> 00:02:32,000
neighbor than we already know about and

68
00:02:36,070 --> 00:02:33,920
it's likely to be a very cool type of

69
00:02:37,830 --> 00:02:36,080
star called the brown dwarf the

70
00:02:40,070 --> 00:02:37,840
temperature may be room temperature or

71
00:02:52,710 --> 00:02:40,080
even colder maybe as cold as an iceberg

72
00:02:56,390 --> 00:02:54,949
with wise we expect the unexpected we're

73
00:02:58,470 --> 00:02:56,400
looking for new surprises and new

74
00:02:59,990 --> 00:02:58,480
discoveries and with this exciting

75
00:03:01,589 --> 00:03:00,000
survey we're going to be finding a

76
00:03:02,869 --> 00:03:01,599
treasure trove of discoveries that