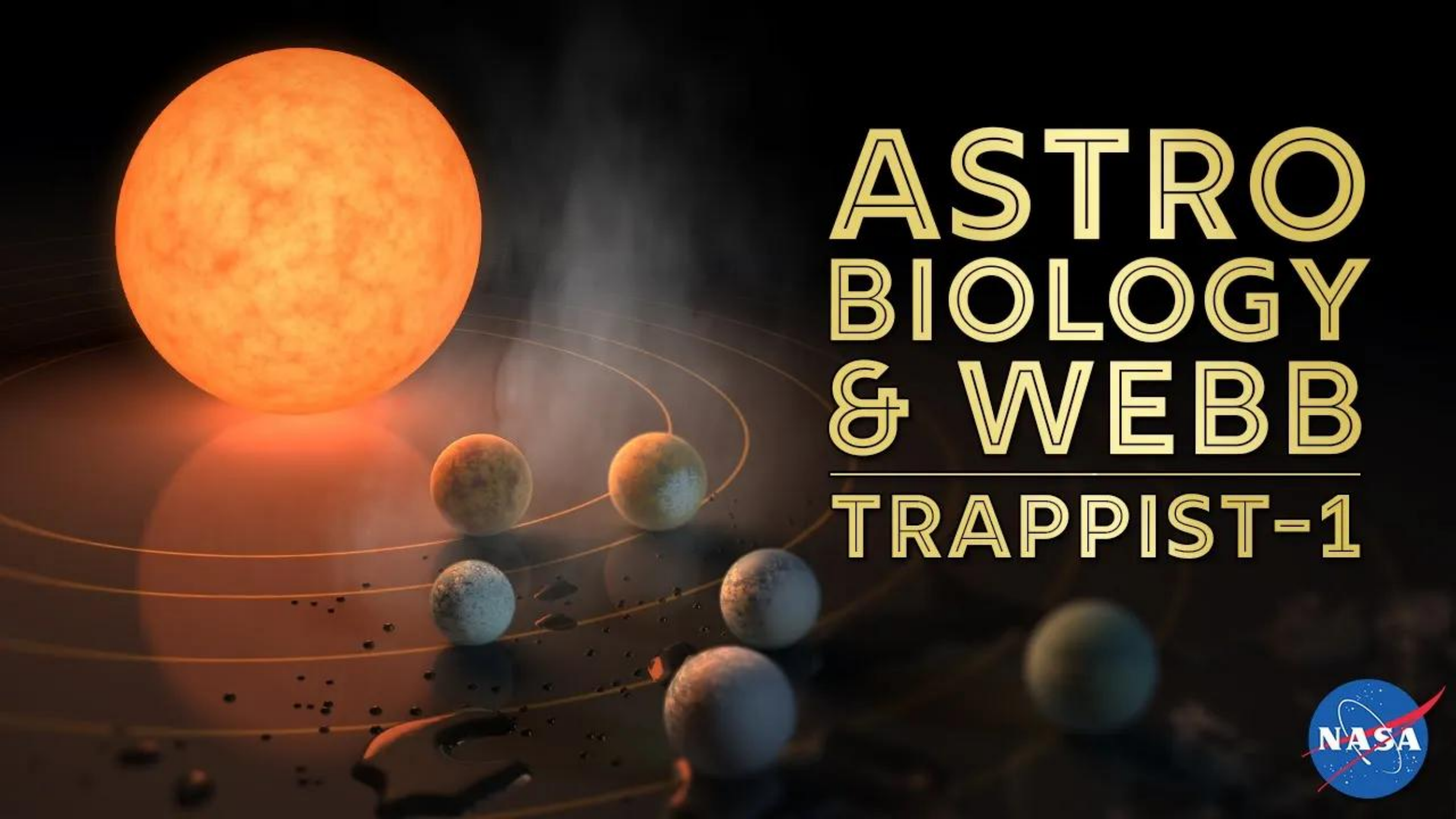
ASTRO
BIOLOGY
& WEBB
TRAPPIST-1
NASA

1
00:00:09,270 --> 00:00:06,150
[Music]

2
00:00:12,070 --> 00:00:09,280
well trappist-1 is a really exciting

3
00:00:14,629 --> 00:00:12,080
system for james webb to observe it's

4
00:00:17,349 --> 00:00:14,639
going to observe trappist-1 early

5
00:00:19,029 --> 00:00:17,359
in its uh operating cycle

6
00:00:21,109 --> 00:00:19,039
and the reason why astronomers are so

7
00:00:23,029 --> 00:00:21,119
excited by trappist-1 is that it's a

8
00:00:25,429 --> 00:00:23,039
system of seven

9
00:00:27,830 --> 00:00:25,439
you know not just one or two but seven

10
00:00:30,310 --> 00:00:27,840
rocky planets orbiting a really low mass

11
00:00:32,709 --> 00:00:30,320
star this is really really interesting

12
00:00:35,510 --> 00:00:32,719
because these planets sort of are a

13
00:00:38,069 --> 00:00:35,520

natural laboratory to study processes

14
00:00:39,590 --> 00:00:38,079
that might impact planetary habitability

15
00:00:41,350 --> 00:00:39,600
and the reason for that is because some

16
00:00:43,430 --> 00:00:41,360
of the planets in that system are too

17
00:00:45,430 --> 00:00:43,440
close to the star to be habitable

18
00:00:47,430 --> 00:00:45,440
they're probably too hot some of the

19
00:00:48,950 --> 00:00:47,440
planets in that system are just the

20
00:00:51,189 --> 00:00:48,960
right distance from their star to

21
00:00:52,869 --> 00:00:51,199
possibly be habitable and then at least

22
00:00:55,590 --> 00:00:52,879
one of the planets in the system is

23
00:00:57,110 --> 00:00:55,600
probably too cold to be habitable if i

24
00:01:00,549 --> 00:00:57,120
were to guess i would probably guess

25
00:01:02,470 --> 00:01:00,559
that it's cold and frozen over so by

26
00:01:04,390 --> 00:01:02,480
studying all the planets in the system

27
00:01:06,789 --> 00:01:04,400
and comparing and contrasting their

28
00:01:09,910 --> 00:01:06,799
characteristics we might learn more

29
00:01:12,870 --> 00:01:09,920
about how planetary habitability varies

30
00:01:14,950 --> 00:01:12,880
as you move out or inward from your

31
00:01:16,950 --> 00:01:14,960
distance from your parent star and also

32
00:01:19,749 --> 00:01:16,960
about the different processes that can

33
00:01:21,510 --> 00:01:19,759
enable or maybe destroy habitability at

34
00:01:23,830 --> 00:01:21,520
different distances from your star so

35
00:01:26,550 --> 00:01:23,840
that's really really exciting and all of

36
00:01:28,070 --> 00:01:26,560
these planets are orbiting the same star

37
00:01:29,590 --> 00:01:28,080
so we know they're all formed together

38
00:01:31,749 --> 00:01:29,600

they all form from the same material

39
00:01:34,069 --> 00:01:31,759
they all experience the same processes

40
00:01:36,390 --> 00:01:34,079
from the star over their lifetime so

41
00:01:38,230 --> 00:01:36,400
it's a really really nice system to use

42
00:01:40,310 --> 00:01:38,240
for this kind of comparison

43
00:01:42,230 --> 00:01:40,320
and of course we also want to search for

44
00:01:44,710 --> 00:01:42,240
bio signatures in the atmospheres of the

45
00:01:46,469 --> 00:01:44,720
potentially habitable trappist-1 planets

46
00:01:48,389 --> 00:01:46,479
and if we find things that'll be really

47
00:01:51,910 --> 00:01:48,399
really interesting because these

48
00:01:53,749 --> 00:01:51,920
low-mass stars like trappist-1 are um

49
00:01:57,109 --> 00:01:53,759
they're very different from our massive

50
00:01:59,830 --> 00:01:57,119
sun-like stars these low-mass stars tend

51
00:02:01,749 --> 00:01:59,840
to be they're really really active they

52
00:02:03,830 --> 00:02:01,759
produce a lot of high-energy stellar

53
00:02:06,789 --> 00:02:03,840
flares they produce a lot of high-energy

54
00:02:09,190 --> 00:02:06,799
radiation so whatever evolutionary

55
00:02:11,270 --> 00:02:09,200
history these planets have had over time

56
00:02:13,510 --> 00:02:11,280
it's probably pretty different from the

57
00:02:15,750 --> 00:02:13,520
planets of our solar system just because

58
00:02:17,670 --> 00:02:15,760
its star behaves so differently and so

59
00:02:20,150 --> 00:02:17,680
it'll also be really really interesting

60
00:02:21,910 --> 00:02:20,160
to compare the planets in the system to

61
00:02:22,790 --> 00:02:21,920
the rocky planets of our solar system

62
00:02:24,470 --> 00:02:22,800
and see

63
00:02:27,510 --> 00:02:24,480

in what ways are these planets different