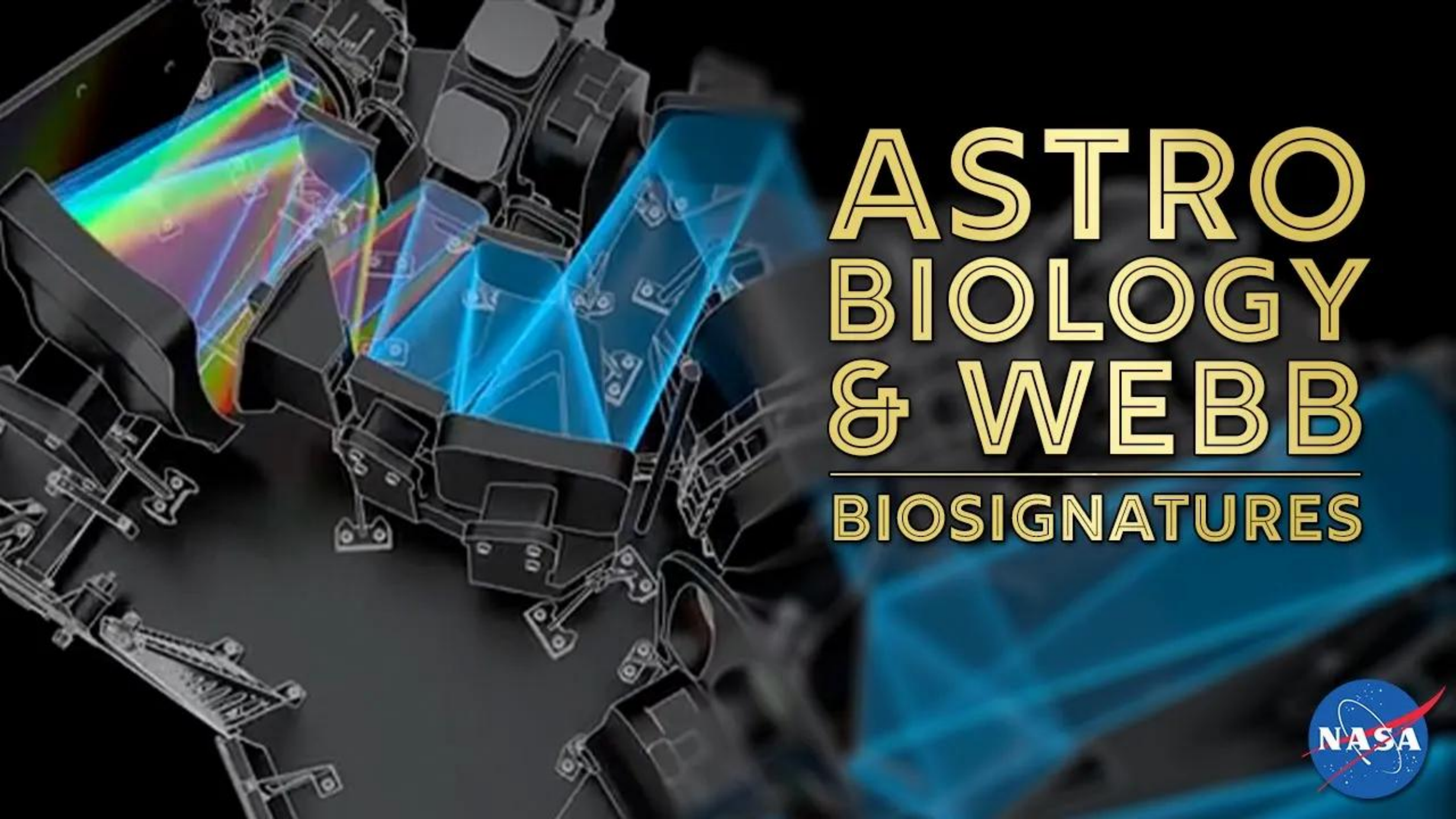
ASTRO
BIOLOGY
& WEBB
BIOSIGNATURES
NASA

1
00:00:10,470 --> 00:00:08,390
we're really excited to use the jameson

2
00:00:12,390 --> 00:00:10,480
space telescope to look for signs of

3
00:00:14,070 --> 00:00:12,400
life in the atmospheres of potentially

4
00:00:15,829 --> 00:00:14,080
habitable planets

5
00:00:17,830 --> 00:00:15,839
and in particular we're searching for

6
00:00:20,310 --> 00:00:17,840
signatures called biosignatures which

7
00:00:22,150 --> 00:00:20,320
are remotely observable signs of life

8
00:00:24,310 --> 00:00:22,160
now on earth some of the important

9
00:00:26,710 --> 00:00:24,320
biosignatures of our own planet are

10
00:00:28,550 --> 00:00:26,720
oxygen which is produced by oxygenic

11
00:00:31,109 --> 00:00:28,560
photosynthesis that of course we all

12
00:00:32,790 --> 00:00:31,119
know plants do that there's all sorts of

13
00:00:34,790 --> 00:00:32,800

microbes that also do oxygenic

14
00:00:37,030 --> 00:00:34,800
photosynthesis and a lot of people

15
00:00:38,150 --> 00:00:37,040
consider it the dominant metabolism of

16
00:00:40,229 --> 00:00:38,160
our planet

17
00:00:42,950 --> 00:00:40,239
another important bio signature of earth

18
00:00:44,630 --> 00:00:42,960
is methane a methane on our planet is

19
00:00:46,389 --> 00:00:44,640
produced by microbes that live in a

20
00:00:48,150 --> 00:00:46,399
variety of places ranging from

21
00:00:50,630 --> 00:00:48,160
hydrothermal vents at the bottom of the

22
00:00:52,549 --> 00:00:50,640
ocean to the guts of cows and they

23
00:00:54,389 --> 00:00:52,559
produce most of the methane that's in

24
00:00:56,630 --> 00:00:54,399
our planet's atmosphere

25
00:00:58,470 --> 00:00:56,640
so these are important gases that we

26
00:01:00,310 --> 00:00:58,480
want to look for in the atmospheres of

27
00:01:02,229 --> 00:01:00,320
exoplanets with the james webb space

28
00:01:04,469 --> 00:01:02,239
telescope but you also have to really

29
00:01:06,950 --> 00:01:04,479
carefully interpret that gas that is

30
00:01:09,109 --> 00:01:06,960
does it make sense for life to produce

31
00:01:12,390 --> 00:01:09,119
that given bio signature in that given

32
00:01:13,910 --> 00:01:12,400
environment and then really importantly

33
00:01:16,630 --> 00:01:13,920
you also want to rule out what are

34
00:01:18,789 --> 00:01:16,640
called biosignature false positives

35
00:01:22,550 --> 00:01:18,799
biosignature false positives are

36
00:01:24,310 --> 00:01:22,560
non-life ways that a planet can fool you

37
00:01:25,990 --> 00:01:24,320
by producing you know something that

38
00:01:27,510 --> 00:01:26,000

looks like a bio signature but it's not

39
00:01:29,830 --> 00:01:27,520
actually a biosignature because it's not

40
00:01:31,990 --> 00:01:29,840
produced by life it's produced by some

41
00:01:34,149 --> 00:01:32,000
other process like vulcanism or

42
00:01:36,550 --> 00:01:34,159
atmospheric chemistry or you know any

43
00:01:39,030 --> 00:01:36,560
other process that doesn't involve life

44
00:01:41,190 --> 00:01:39,040
so all this together means this is a

45
00:01:43,670 --> 00:01:41,200
really exciting search but it's going to

46
00:01:45,270 --> 00:01:43,680
be complicated and if we detect

47
00:01:47,510 --> 00:01:45,280
something that we think is a bio

48
00:01:50,550 --> 00:01:47,520
signature when we look at an exoplanet

49
00:01:52,950 --> 00:01:50,560
it might not immediately be definitive

50
00:01:55,270 --> 00:01:52,960
it might be ambiguous until we collect