# Detectability of Surface Biosignatures for Directly Imaged Exoplanets

Gabrielle Jones, Schuyler Borges, Tyler Robinson
gabriellegjones18@gmail.com
Department of Astronomy and Planetary Science, Northern Arizona University


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1
00:00:03,669 --> 00:00:02,070
hello i'm gabrielle jones and i will be

2
00:00:05,510 --> 00:00:03,679
presenting on the detectability of

3
00:00:07,110 --> 00:00:05,520
surface biosignatures for directly

4
00:00:09,190 --> 00:00:07,120
imaged exoplanets

5
00:00:10,790 --> 00:00:09,200
currently it is unknown if no resources

6
00:00:13,110 --> 00:00:10,800
will allow for the detection of these

7
00:00:15,110 --> 00:00:13,120
surface biosignatures on an exoplanet

8
00:00:16,790 --> 00:00:15,120
we modeled an exoplanet's atmosphere

9
00:00:18,710 --> 00:00:16,800
with earth-like conditions and computed

10
00:00:19,670 --> 00:00:18,720
definitive detection times of surface

11
00:00:21,670 --> 00:00:19,680
biosignatures

12
00:00:23,750 --> 00:00:21,680
using the atmospheric radiative transfer

13
00:00:24,710 --> 00:00:23,760

model smart and the luvoir noise

14
00:00:26,390 --> 00:00:24,720
detection model

15
00:00:28,310 --> 00:00:26,400
the surface biosignatures we are

16
00:00:29,669 --> 00:00:28,320
focusing on are biological pigments and

17
00:00:31,830 --> 00:00:29,679
the vegetation red edge

18
00:00:33,110 --> 00:00:31,840
we used orange and black microbial mats

19
00:00:34,470 --> 00:00:33,120
because they have been prevalent on

20
00:00:36,389 --> 00:00:34,480
earth throughout its history

21
00:00:37,590 --> 00:00:36,399
and have prominent vre and pigment

22
00:00:39,350 --> 00:00:37,600
absorption features

23
00:00:41,030 --> 00:00:39,360
we found that 100 black matte is

24
00:00:43,750 --> 00:00:41,040
detected both in 12 hours

25
00:00:44,470 --> 00:00:43,760
100 orange mat is detectable within 22

26
00:00:46,549 --> 00:00:44,480
hours

27
00:00:48,310 --> 00:00:46,559
and is quite reasonable to devote tens

28
00:00:50,549 --> 00:00:48,320
of hours of observation time

29
00:00:52,549 --> 00:00:50,559
to detect life on another planet

30
00:00:54,869 --> 00:00:52,559
understanding techniques for detecting

31
00:00:56,470 --> 00:00:54,879
life on exoplanet surfaces will aid in

32
00:00:58,470 --> 00:00:56,480
our search for life beyond earth

33
00:00:59,910 --> 00:00:58,480
and one inform future telescope missions