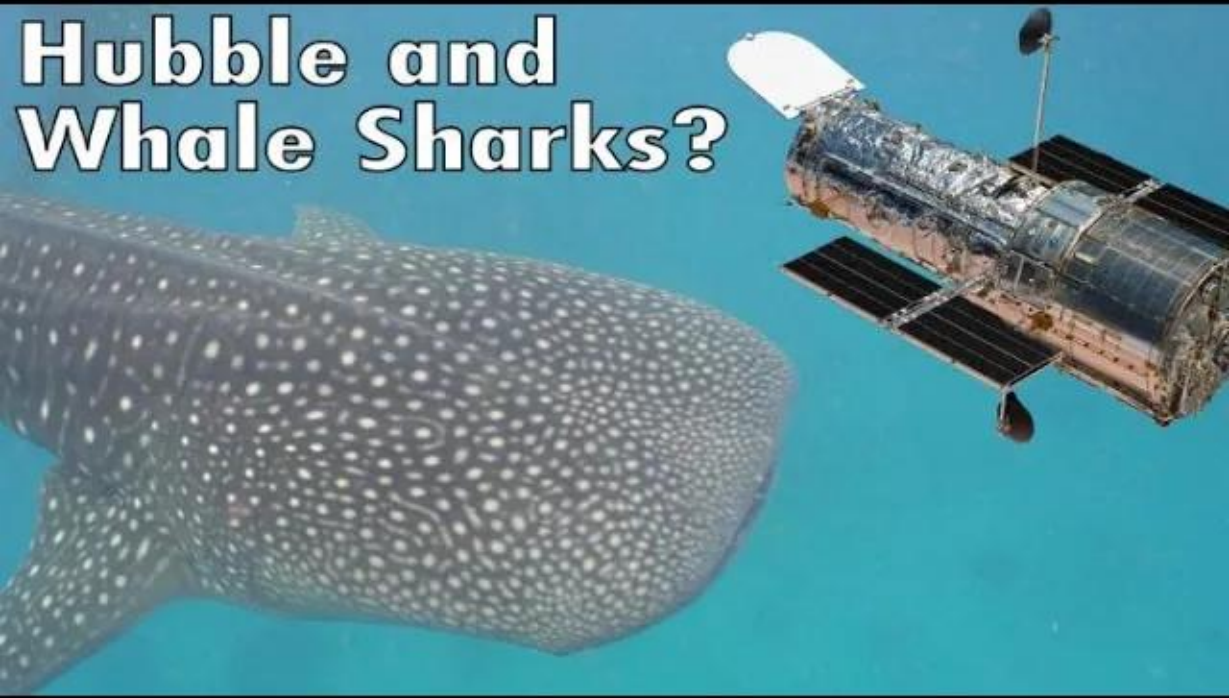
Hubble and
Whale Sharks?

1
00:00:07,030 --> 00:00:04,950
[Applause]

2
00:00:09,190 --> 00:00:07,040
while you might not think that sharks in

3
00:00:11,669 --> 00:00:09,200
the hubble space telescope have a lot in

4
00:00:13,830 --> 00:00:11,679
common it turns out they share an

5
00:00:16,150 --> 00:00:13,840
incredible bond

6
00:00:17,750 --> 00:00:16,160
astronomers needed a powerful tool for

7
00:00:19,510 --> 00:00:17,760
comparing and matching star

8
00:00:22,550 --> 00:00:19,520
configurations

9
00:00:24,790 --> 00:00:22,560
so physics professor edward j groth

10
00:00:27,750 --> 00:00:24,800
invented a pattern matching algorithm to

11
00:00:30,150 --> 00:00:27,760
help map all of those stars

12
00:00:32,950 --> 00:00:30,160
the graph algorithm forms triangles

13
00:00:34,310 --> 00:00:32,960

between every possible triplet of stars

14
00:00:35,910 --> 00:00:34,320
in an image

15
00:00:38,389 --> 00:00:35,920
it then compares the triangle's

16
00:00:40,150 --> 00:00:38,399
measurements to those in other images to

17
00:00:42,310 --> 00:00:40,160
find matches

18
00:00:46,549 --> 00:00:42,320
but what do stars have in common with

19
00:00:48,790 --> 00:00:46,559
sharks it turns out quite a bit

20
00:00:51,590 --> 00:00:48,800
for years conservation groups have been

21
00:00:53,750 --> 00:00:51,600
tracking individual whale sharks

22
00:00:56,229 --> 00:00:53,760
this beautiful animal has been listed as

23
00:00:58,310 --> 00:00:56,239
vulnerable to extinction so it's

24
00:00:59,910 --> 00:00:58,320
important to know how many exist and

25
00:01:02,790 --> 00:00:59,920
where they go throughout their life

26
00:01:05,189 --> 00:01:02,800
spans but tagging them is difficult and

27
00:01:07,190 --> 00:01:05,199
often the electronic trackers break

28
00:01:09,030 --> 00:01:07,200
after just a few months

29
00:01:10,950 --> 00:01:09,040
there was another way

30
00:01:12,950 --> 00:01:10,960
conservationists could comb through

31
00:01:15,190 --> 00:01:12,960
countless photographs of sharks and

32
00:01:17,990 --> 00:01:15,200
identify them by the distinctive white

33
00:01:20,390 --> 00:01:18,000
spots on their skin a marker as unique

34
00:01:22,710 --> 00:01:20,400
as fingerprints are in humans

35
00:01:23,590 --> 00:01:22,720
but this was tedious and time-consuming

36
00:01:25,670 --> 00:01:23,600
work

37
00:01:27,270 --> 00:01:25,680
and that's when hubble comes into the

38
00:01:29,590 --> 00:01:27,280

picture

39
00:01:31,590 --> 00:01:29,600
using a modified version of groth's

40
00:01:34,630 --> 00:01:31,600
algorithm instead of measuring the

41
00:01:36,469 --> 00:01:34,640
triangles made by stars conservationists

42
00:01:39,429 --> 00:01:36,479
were able to measure the distance of the

43
00:01:42,630 --> 00:01:39,439
whale shark's unique spots

44
00:01:45,350 --> 00:01:42,640
using this system over 8 000 individual

45
00:01:47,429 --> 00:01:45,360
whale sharks have been identified so far

46
00:01:49,830 --> 00:01:47,439
providing continuing data that helps

47
00:01:51,990 --> 00:01:49,840
researchers learn more about the lives

48
00:01:54,389 --> 00:01:52,000
and migration patterns of the threatened

49
00:01:57,109 --> 00:01:54,399
animal so while the hubble space

50
00:01:59,749 --> 00:01:57,119
telescope might be way up above in space

51
00:02:03,480 --> 00:01:59,759
and whale sharks are way down underwater