



1
00:00:06,070 --> 00:00:03,270

[Music]

2
00:00:08,390 --> 00:00:06,080

we discovered bucky balls in space

3
00:00:10,390 --> 00:00:08,400

fullerenes or buckminster fullerenes as

4
00:00:14,549 --> 00:00:10,400

they're called in full are in fact an

5
00:00:18,630 --> 00:00:16,310

bucket balls are these microscopic

6
00:00:20,790 --> 00:00:18,640

particles made of carbon that are

7
00:00:23,109 --> 00:00:20,800

arranged in a very specific pattern of

8
00:00:32,950 --> 00:00:23,119

pentagons and hexagons which gives them

9
00:00:37,110 --> 00:00:35,030

bucky balls are like soccer balls in the

10
00:00:39,830 --> 00:00:37,120

precise way that the carbon atoms make

11
00:00:41,430 --> 00:00:39,840

up a pattern of pentagons and hexagons

12
00:00:43,590 --> 00:00:41,440

in that sense chemical structure of

13
00:00:45,590 --> 00:00:43,600

these bucky balls is exactly the same as

14

00:00:47,750 --> 00:00:45,600

a soccer ball

15

00:00:49,990 --> 00:00:47,760

we can detect buggy balls in space

16

00:00:51,910 --> 00:00:50,000

through their vibrational motions

17

00:00:54,549 --> 00:00:51,920

these bucky balls they oscillate or

18

00:00:56,950 --> 00:00:54,559

vibrate in very different ways and each

19

00:00:58,869 --> 00:00:56,960

way they vibrate corresponds to a very

20

00:01:01,189 --> 00:00:58,879

specific color of infrared light that

21

00:01:03,349 --> 00:01:01,199

they emit or absorb so it's the first

22

00:01:06,149 --> 00:01:03,359

detection of an entire new class of

23

00:01:08,230 --> 00:01:06,159

molecules that we know on earth but that

24

00:01:10,550 --> 00:01:08,240

we didn't know for sure whether or not

25

00:01:12,710 --> 00:01:10,560

they existed in space

26

00:01:14,469 --> 00:01:12,720

bucky balls are now the largest known

27

00:01:16,950 --> 00:01:14,479

molecules in space

28

00:01:19,670 --> 00:01:16,960

um and we have discovered them using the

29

00:01:21,510 --> 00:01:19,680

spitzer space telescope as strummers are

30

00:01:23,670 --> 00:01:21,520

excited about the discovery of

31

00:01:25,030 --> 00:01:23,680

pickleballs in space first of all

32

00:01:27,990 --> 00:01:25,040

because it is something that we have

33

00:01:29,590 --> 00:01:28,000

been looking for for about 25 years now

34

00:01:32,230 --> 00:01:29,600

the main reason being that these

35

00:01:34,870 --> 00:01:32,240

buckyballs are amongst the most stable

36

00:01:36,789 --> 00:01:34,880

and most most durable molecules that we

37

00:01:38,550 --> 00:01:36,799

know on earth so they're ideal

38

00:01:41,030 --> 00:01:38,560

candidates to survive the harsh