



1
00:00:07,550 --> 00:00:04,550
except when we discovered buckyballs in

2
00:00:10,339 --> 00:00:07,560
space fullerenes or buckminsterfullerene

3
00:00:15,350 --> 00:00:10,349
sets are calling foo are in fact an

4
00:00:17,450 --> 00:00:15,360
entire class of molecules what balls are

5
00:00:19,519 --> 00:00:17,460
these microscopic particles made of

6
00:00:21,590 --> 00:00:19,529
carbon that are arranged in a very

7
00:00:24,230 --> 00:00:21,600
specific pattern of pentagons and

8
00:00:32,229 --> 00:00:24,240
hexagons which gives them the shape of a

9
00:00:37,189 --> 00:00:35,060
bucky balls are like soccer balls in the

10
00:00:39,439 --> 00:00:37,199
precise way that the carbon atoms make

11
00:00:41,420 --> 00:00:39,449
up a pattern of pentagons and hexagons

12
00:00:43,310 --> 00:00:41,430
in that sense chemical structure of

13
00:00:46,250 --> 00:00:43,320

these balls is exactly the same

14

00:00:48,200 --> 00:00:46,260

as a soccer ball we can detect

15

00:00:50,810 --> 00:00:48,210

buckyballs in space through their

16

00:00:53,030 --> 00:00:50,820

vibrational motions these buckyballs

17

00:00:55,460 --> 00:00:53,040

they oscillate or vibrate in very

18

00:00:58,009 --> 00:00:55,470

different ways and each way they vibrate

19

00:00:59,920 --> 00:00:58,019

corresponds to a very specific color of

20

00:01:02,240 --> 00:00:59,930

infrared light than they emit or absorb

21

00:01:05,149 --> 00:01:02,250

so it's the first detection of an entire

22

00:01:07,130 --> 00:01:05,159

new class of molecules that we know on

23

00:01:10,179 --> 00:01:07,140

earth but that we didn't know for sure

24

00:01:12,679 --> 00:01:10,189

whether or not they existed in space

25

00:01:15,530 --> 00:01:12,689

buckyballs are now the largest known

26

00:01:17,510 --> 00:01:15,540

molecules in space and we have

27

00:01:20,570 --> 00:01:17,520

discovered them using the Spitzer Space

28

00:01:22,580 --> 00:01:20,580

Telescope astronomers are excited about

29

00:01:24,590 --> 00:01:22,590

the discovery of big balls in space

30

00:01:26,149 --> 00:01:24,600

first of all because it is something

31

00:01:29,240 --> 00:01:26,159

that we have been looking for for about

32

00:01:31,280 --> 00:01:29,250

25 years now the main reason being that

33

00:01:34,609 --> 00:01:31,290

these bucky balls are amongst the most

34

00:01:36,529 --> 00:01:34,619

stable and most most durable molecules

35

00:01:38,480 --> 00:01:36,539

that we know on earth so they're ideal

36

00:01:40,370 --> 00:01:38,490

candidates to survive the harsh