



1
00:00:01,850 --> 00:00:03,810
(Sound of giant explosion)

2
00:00:03,810 --> 00:00:05,050
Narrator: The first type of molecule

3
00:00:05,050 --> 00:00:06,960
that ever formed in the universe

4
00:00:06,960 --> 00:00:10,170
has been found in deep space.

5
00:00:10,170 --> 00:00:12,100
Researchers with the airborne observatory

6
00:00:12,100 --> 00:00:15,470
SOFIA have detected this molecule for the first time

7
00:00:15,470 --> 00:00:17,920
in the present-day universe.

8
00:00:17,920 --> 00:00:21,600
The molecule is a combination of helium and hydrogen

9
00:00:21,600 --> 00:00:24,510
called helium hydride.

10
00:00:24,510 --> 00:00:27,090
David Neufeld: Helium hydride is one of a few

11
00:00:27,090 --> 00:00:30,220
molecules that you can make with the available

12
00:00:30,220 --> 00:00:33,170
ingredients that were present before

13
00:00:33,170 --> 00:00:35,160

any stars were formed.

14

00:00:35,160 --> 00:00:36,920

And those were the elements hydrogen,

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00:00:36,920 --> 00:00:38,990

helium, and lithium.

16

00:00:38,990 --> 00:00:40,840

Narrator: Over billions of years, the chemistry

17

00:00:40,840 --> 00:00:42,930

of the universe continued to evolve,

18

00:00:42,930 --> 00:00:46,220

eventually building everything we know of today.

19

00:00:46,220 --> 00:00:48,260

David Neufeld: The presence of molecules was very

20

00:00:48,260 --> 00:00:51,390

important in the evolution of the universe.

21

00:00:51,390 --> 00:00:54,830

So, this can be thought of as the very first step

22

00:00:54,830 --> 00:00:59,070

on a path of increasing complexity in our universe.

23

00:00:59,070 --> 00:01:01,860

Starting with this very simple molecule,

24

00:01:01,860 --> 00:01:05,560

and of course, ending up with DNA.

25

00:01:05,560 --> 00:01:07,170

Narrator: Scientists have been searching for this

26

00:01:07,170 --> 00:01:09,920

simple molecule in space for decades,

27

00:01:09,920 --> 00:01:13,800

but it has eluded detection...until now.

28

00:01:13,800 --> 00:01:17,730

SOFIA detected helium hydride around an aging star

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00:01:17,730 --> 00:01:19,550

3,000 light years away

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00:01:19,550 --> 00:01:22,320

in the constellation Cygnus.

31

00:01:22,320 --> 00:01:25,220

Despite previous searches, it took SOFIA

32

00:01:25,220 --> 00:01:28,190

and new upgrades to its technology to finally

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00:01:28,190 --> 00:01:30,760

detect helium hydride.

34

00:01:30,760 --> 00:01:33,160

Naseem Rangwala: SOFIA provided a unique platform

35

00:01:33,160 --> 00:01:36,800

for this discovery of helium hydride molecule to happen.

36

00:01:36,800 --> 00:01:38,760

Unlike a space-based observatory,

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00:01:38,760 --> 00:01:41,070

SOFIA lands every morning.

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00:01:41,070 --> 00:01:43,700

This allows us to change instruments, and upgrade

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00:01:43,700 --> 00:01:46,740

instruments using the latest technology

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00:01:46,740 --> 00:01:49,680

to address new questions in astrophysics.

41

00:01:49,680 --> 00:01:52,460

The discovery of the helium hydride molecule

42

00:01:52,460 --> 00:01:54,480

is a perfect example.

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00:01:54,480 --> 00:01:57,560

We had the right combination of technology

44

00:01:57,560 --> 00:02:01,570

and capability to make this detection.

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00:02:01,570 --> 00:02:03,570

Narrator: NASA and the German Aerospace Center

46

00:02:03,570 --> 00:02:04,960

work jointly to manage

47

00:02:04,960 --> 00:02:07,940

the SOFIA airborne observatory.