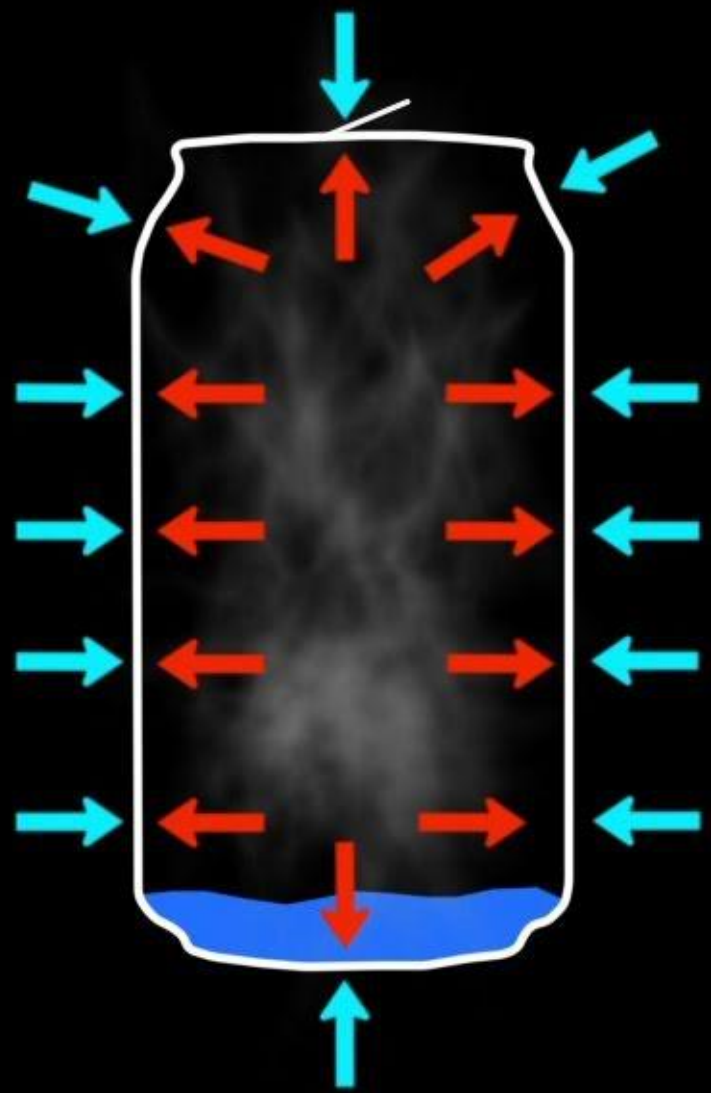

1
00:00:00,010 --> 00:00:11,110
Music

2
00:00:11,130 --> 00:00:15,150
Narrator: This demonstration explores what happens inside a large

3
00:00:15,170 --> 00:00:19,200
star when fusion stops at the end of its life. You're going to need

4
00:00:19,220 --> 00:00:23,230
an empty aluminum soda can, a hot

5
00:00:23,250 --> 00:00:27,290
plate, some water,

6
00:00:27,310 --> 00:00:31,330
something to measure the water with, like a tablespoon,

7
00:00:31,350 --> 00:00:35,390
a bowl of ice water, and a pair of tongs

8
00:00:35,410 --> 00:00:39,440
to flip the can over. First, place a small amount of water inside the aluminum

9
00:00:39,460 --> 00:00:43,510
soda can, about a tablespoon or two. Set the can on the

10
00:00:43,530 --> 00:00:47,540
hot plate, and heat until the water starts to boil. Listen for the sound

11
00:00:47,560 --> 00:00:51,560
of the water boiling and look for steam coming out of the top. When plenty of

12
00:00:51,580 --> 00:00:55,600
steam is coming out of the top of the soda can, quickly pick it up with the tongs and

13
00:00:55,620 --> 00:00:59,620

flip it over, open side down, into the bowl of ice water. It helps to use

14
00:00:59,640 --> 00:01:03,660
an underhand motion, so you can easily flip your wrist over and dunk the can.

15
00:01:03,680 --> 00:01:07,680
The can will implode, just like the core of a large star.

16
00:01:07,700 --> 00:01:11,690
This activity is all about balance, or equilibrium. When you

17
00:01:11,710 --> 00:01:15,710
have an empty soda can, the air pressure on the inside and the air pressure outside

18
00:01:15,730 --> 00:01:19,740
are in equilibrium. When the water boils and you have steam,

19
00:01:19,760 --> 00:01:23,810
the steam on the inside is still in equilibrium with the air pressure on the outside.

20
00:01:23,830 --> 00:01:27,830
But once that steam turns into liquid water, that equilibrium is broken and the can

21
00:01:27,850 --> 00:01:31,850
collapses. Similarly, in a star, you have a balance between

22
00:01:31,870 --> 00:01:35,910
the energy from fusion pushing outwards, and gravity holding the star together for the

23
00:01:35,930 --> 00:01:39,980
majority of the star's life. But when fusion stops, all of a sudden that