Meet the kinetic
Alfvén wave.

1
00:00:00,020 --> 00:00:04,030
music

2
00:00:04,040 --> 00:00:06,820
Meet the kinetic Alfvén wave.

3
00:00:06,900 --> 00:00:11,880
These tiny waves carry energy from one place to another as they flow through the charged particles - or plasm

4
00:00:12,000 --> 00:00:16,400
For over a half century, scientist have wondered exactly how the wave interacts with the plasma particles.

5
00:00:16,420 --> 00:00:21,520
NASA's MMS mission was able to observe kinetic Alfvén waves down to the scale of how particles move, for th

6
00:00:21,520 --> 00:00:26,920
We can see that the wave traps the particles in clumps between its peaks.

7
00:00:26,920 --> 00:00:31,700
This trapping allows energy to cycle efficiently back and forth between the wave and plasma.

8
00:00:31,820 --> 00:00:37,280
MMS could see such small scales, because the four observatories fly in the closest multispacecraft formation e

9
00:00:37,280 --> 00:00:44,220
With 3D data from MMS, we study plasma physics near Earth -- which sheds light on fundamental physics thro

10
00:00:44,220 --> 00:00:49,140
By exploring kinetic Alfvén waves in near-Earth space, we can better understand plasma processes that gener

11
00:00:49,140 --> 00:00:52,860
like how energy moves in plasma in nuclear fusion reactors,

12
00:00:52,860 --> 00:00:58,300
or how heat moves in the solar wind, the constant flow of plasma from the sun that fills the solar system.