



1

00:00:00,770 --> 00:00:04,680

A new NASA-funded study has revealed the origins of spicules

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00:00:04,700 --> 00:00:08,350

– lengthy jets of plasma on the sun’s surface.

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00:00:08,370 --> 00:00:14,230

Scientists have been observing these long strands of solar material since the end of the 19th century,

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00:00:14,250 --> 00:00:19,730

but their origins have been difficult to study because they’re highly dynamic and short-lived.

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00:00:19,750 --> 00:00:24,450

There are roughly 10 million spicules on the surface at any given time.

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00:00:24,470 --> 00:00:29,360

They can grow up to 6,000 miles long and jet off the sun at 60 miles per second.

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00:00:29,380 --> 00:00:34,070

Each one appears and collapses over the course of 5 to 10 minutes.

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00:00:34,090 --> 00:00:38,530

Until recently, what drives these jets has been a mystery.

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00:00:38,550 --> 00:00:45,200

In a new study, a model more than 10 years in the making was able to simulate spicules for the first time.

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00:00:45,220 --> 00:00:48,450

Scientists compared the model simulations with observations

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00:00:48,470 --> 00:00:52,780

from NASA’s Interface Region Imaging Spectrograph, or IRIS,

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00:00:52,800 --> 00:00:57,330

and the Swedish 1-meter Solar Telescope based in La Palma, Spain.

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00:00:57,350 --> 00:01:00,220

And found they were closely matched.

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00:01:00,240 --> 00:01:04,840

With an accurate model of spicules, scientists could explore their origins.

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00:01:04,860 --> 00:01:07,930

The model reveals that a key component of spicule formation

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00:01:07,950 --> 00:01:13,560

is the interaction between charged and neutral particles with the magnetic field.

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00:01:13,580 --> 00:01:20,100

Scientists believe that this interaction drags tangled magnetic field lines up above the sun's surface

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00:01:20,120 --> 00:01:26,870

allowing them to straighten and expel solar material at high speeds similar to a whiplash.

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00:01:26,890 --> 00:01:31,380

The model also shows this whiplash process creating strong magnetic waves,

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00:01:31,400 --> 00:01:35,460

which scientists think could participate in heating the sun's atmosphere