



1

00:00:04,810 --> 00:00:10,080

For the first time ever, scientists have created a 3D model of melting snowflake

2

00:00:12,720 --> 00:00:16,590

3D modelling coupled with new research about melting snowflake behavior

3

00:00:16,610 --> 00:00:20,440

serve as one of the first steps for creating better precipitation models

4

00:00:20,460 --> 00:00:24,660

used for weather forecasting and climate modeling in the future.

5

00:00:25,600 --> 00:00:29,950

We've actually known how to measure the size and shape of snow particles for a while

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00:00:29,970 --> 00:00:32,620

But visualizing how a snowflake melts?

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00:00:32,640 --> 00:00:35,250

That was only achieved in the last couple years

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00:00:35,270 --> 00:00:41,070

Actually, by this guy – based at NASA's Jet Propulsion Laboratory in Pasadena, California

9

00:00:41,090 --> 00:00:44,410

probably one of the least snowy places in the United States

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00:00:44,430 --> 00:00:49,870

Nobody else was really doing it and I kind of had a good hunch that it could be done

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00:00:50,730 --> 00:00:55,410

In the past, researchers have adopted some pretty creative methods to catch snowflakes

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00:00:55,430 --> 00:00:58,660

like using spider webs to net the delicate crystalline structures

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00:00:58,680 --> 00:01:01,210

in order to watch their melt behavior

14

00:01:01,230 --> 00:01:06,980

But I don't like the thought of writing this research proposal

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00:01:07,000 --> 00:01:10,410

where I ask for money to breed spiders

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00:01:11,970 --> 00:01:16,540

Understanding the microphysics of a melting snowflake has significant implications

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00:01:16,560 --> 00:01:21,120

About 66% of rain starts as snow higher in the atmosphere

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00:01:21,140 --> 00:01:24,060

And that layer of melting snow can, among other things

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00:01:24,080 --> 00:01:28,770

affect weather patterns, block radio signals, and be a hazard to aircraft

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00:01:29,960 --> 00:01:34,190

The hydrodynamics are actually particularly complex and completely different

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00:01:34,210 --> 00:01:38,580

from the characteristics of rain or even snow that hasn't started melting yet

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00:01:38,600 --> 00:01:42,980

which is what prompted an entirely separate body of research

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00:01:43,000 --> 00:01:47,210

The team created mathematical models that simulate a melting snowflake in nature

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00:01:47,230 --> 00:01:51,350

allowing researchers to study its behavior in a controlled environment

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00:01:52,030 --> 00:01:57,120

It turns out that the degree of riming has a major influence on the melting process

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00:01:57,140 --> 00:02:01,210

Riming is the accumulation of super cold water vapor that freezes

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00:02:01,230 --> 00:02:04,280

instantly when it comes in contact with a snowflake

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00:02:05,480 --> 00:02:09,310

Heavily rimed snowflakes look more like hard, dense ice pellets

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00:02:09,330 --> 00:02:14,690

while lightly rimed, "fluffy", snowflakes often maintain their light, delicate crystals

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00:02:14,710 --> 00:02:18,940

As you've probably already guessed, these fragile snowflakes melt pretty easily

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00:02:18,960 --> 00:02:23,700

whereas hail-like snowflakes are less prone to breaking up during the melting process