

PHYSARUM “self-driving cars can learn from brainless slime mold”



The ‘blob,’ a brainless mystery organism that can solve mazes, makes its public debut

"it's been here for millions of years, and we still don't really know what it is."

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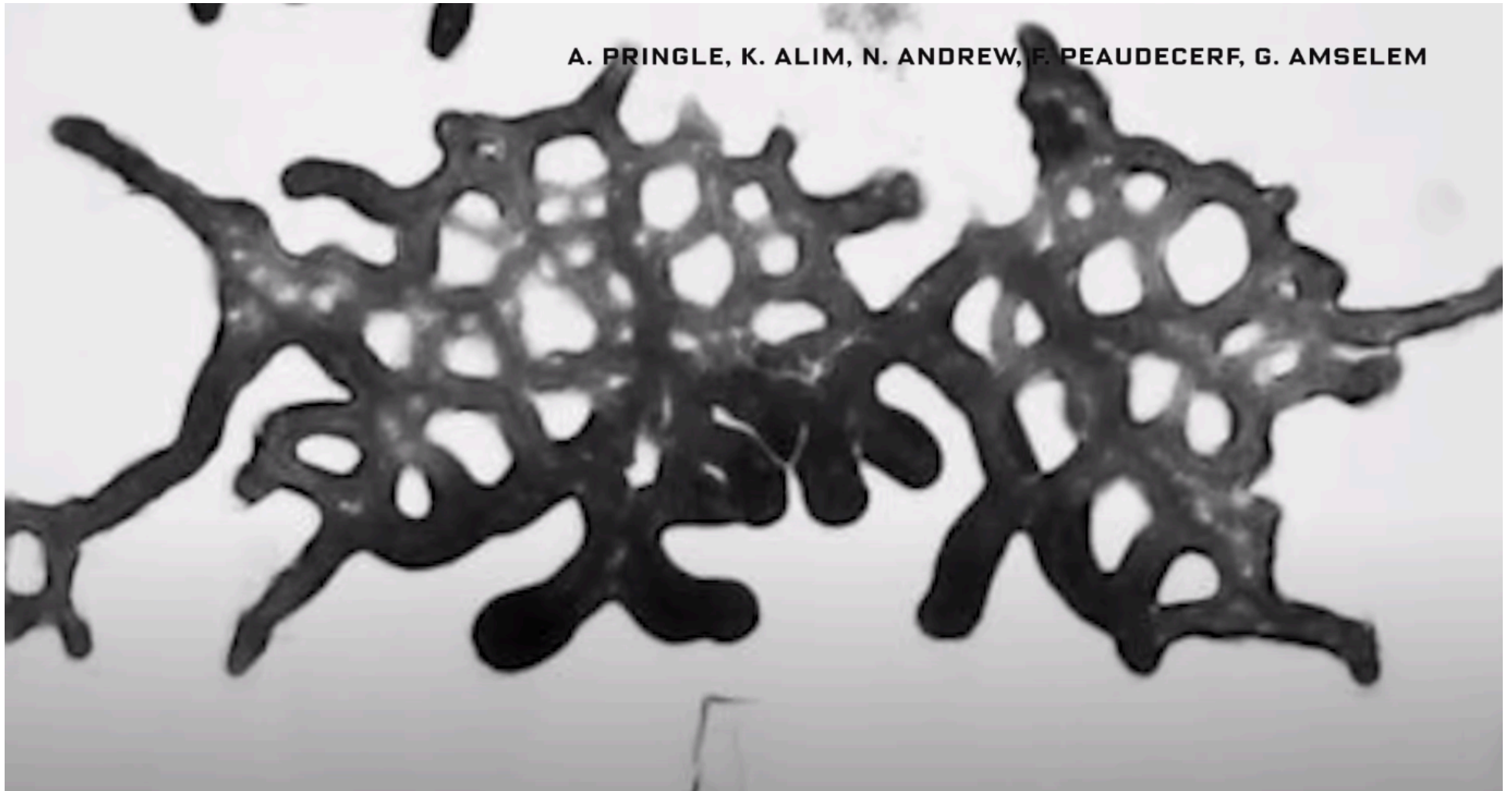
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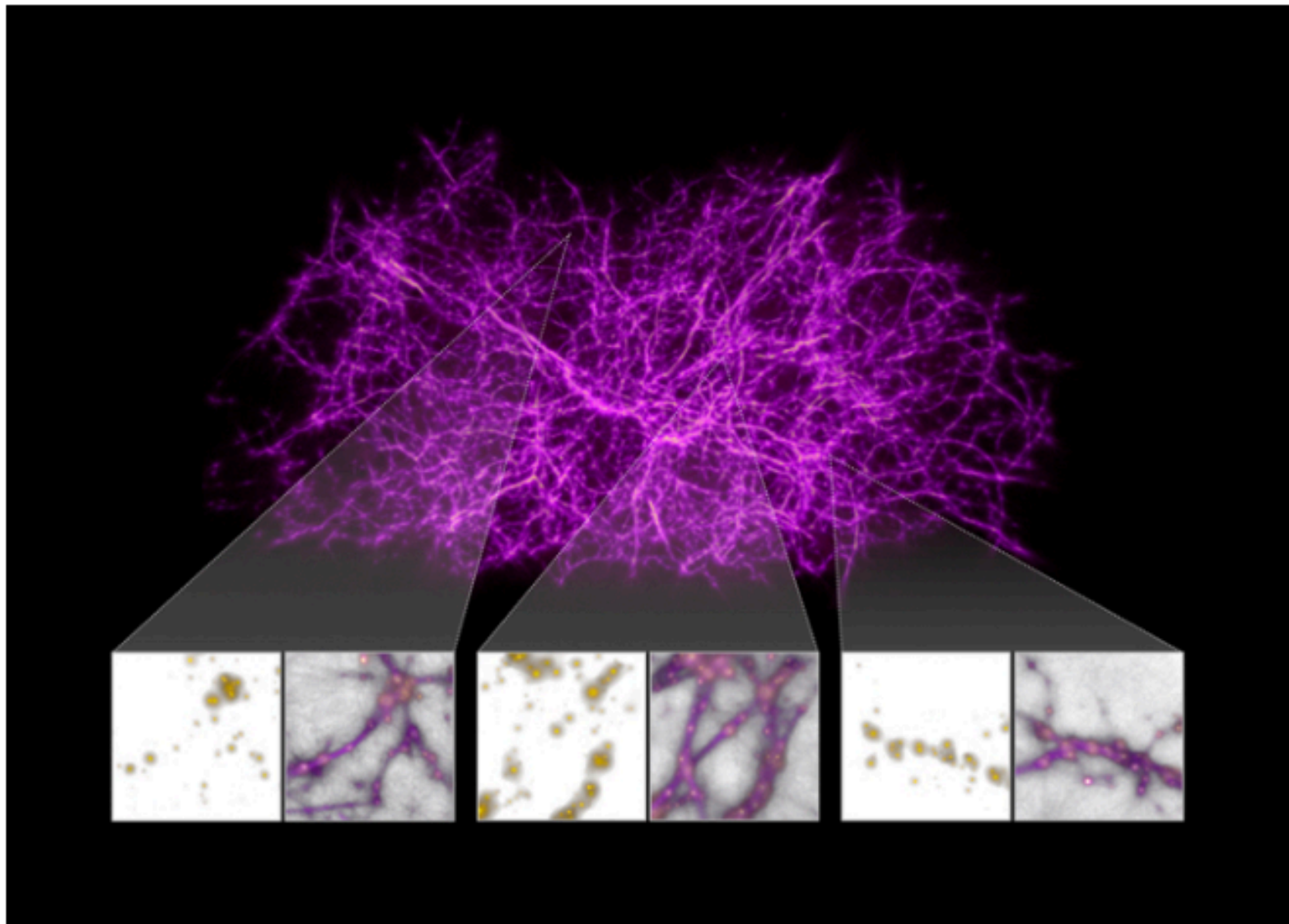
By **Alex Horton**, The Washington Post

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The single-cell slime mold, which lacks a nervous system, has baffled scientists for decades for its ability to learn, pass knowledge to other molds and repair itself in minutes like a headless Wolverine. Those scientists still don't know how exactly to categorize this organism.



(NASA, ESA, and J. Burchett and O. Elek - UC Santa Cruz)

Astronomers have used an algorithm based on the growth patterns of slime mould to map something that's basically impossible to see: the cosmic web of gas and [dark matter](#) underpinning the very structure of the Universe.

Slime mould (*Physarum polycephalum*) is one of the [weirdest life forms on the planet](#), but we shouldn't underestimate these strange, gelatinous blobs.

That's because, despite appearances, this brainless organism – or rather the way it grows outward in branching networks of slimy tendrils – is capable of 'solving' spatial problems that are actually incredibly complex from a computational perspective.

In the past, models based on *P. polycephalum*'s wanderlust have [solved mazes](#), identified the [shortest path between points](#), and even reconstructed the [network of the Tokyo rail system](#).

Just how big does slime mould dare to dream, though? Well, the answer is "pretty big". In new research led by astronomer Joe Burchett from UC Santa Cruz, scientists found *P. polycephalum*'s exploratory instincts stand to help solve one of the grandest unknowns in astrophysics.

Slime molds are protists – mostly single-cell organisms grouped into their own kingdom on the evolutionary family tree because scientists aren't sure where else to put them. And the blob is one of the standouts of the kingdom of wayward organisms, after what could be an evolution that began a billion years ago.

What David described is the blob's exasperating ability to navigate without eyes, limbs or wings. Researchers who sliced up pieces of the organism and sprinkled them in a maze watched them consolidate back into its original form.

When researchers put nutrients at the end of a maze, the blob searched for a way to the food, retreating from dead ends to find the shortest possible way to the prize. That's because it leaves a slime trail that tells itself where it has been, *The Post's* Sarah Kaplan previously reported.

The blob stretches in such an efficient manner that it has replicated human design. One blob re-created the Tokyo rail system after scientists scattered oat flakes in a pattern that resembled Japanese cities around the capital region, *Wired* reported, in a stunning development that one day could lead to engineers looking to slime for cues on urban planning.

Blobs can even pass on what they know to others. In one study, French scientists created a bridge experiment with unpleasant nutrients in the way to make the blob find an alternate path to food on the other side.

Video reference:

<https://sagejenson.com/physarum>

https://youtu.be/40f7_93NlgA?t=148

https://youtu.be/40f7_93NlgA?t=373

<https://youtu.be/-FH4PPHvaE0?t=74>

<https://youtu.be/HyzT5b0tNtk?t=60>

<https://www.sciencealert.com/slime-mould-algorithm-reconstructs-the-cosmic-web-from-set-of-galactic-coordinates>

Simulation:

<https://sagejenson.com/physarum>

https://payload.cargocollective.com/1/18/598881/13800048/network_2.gif

https://payload.cargocollective.com/1/18/598881/13800048/ef_9.gif

<https://payload.cargocollective.com/1/18/598881/13800048/explosion.gif>