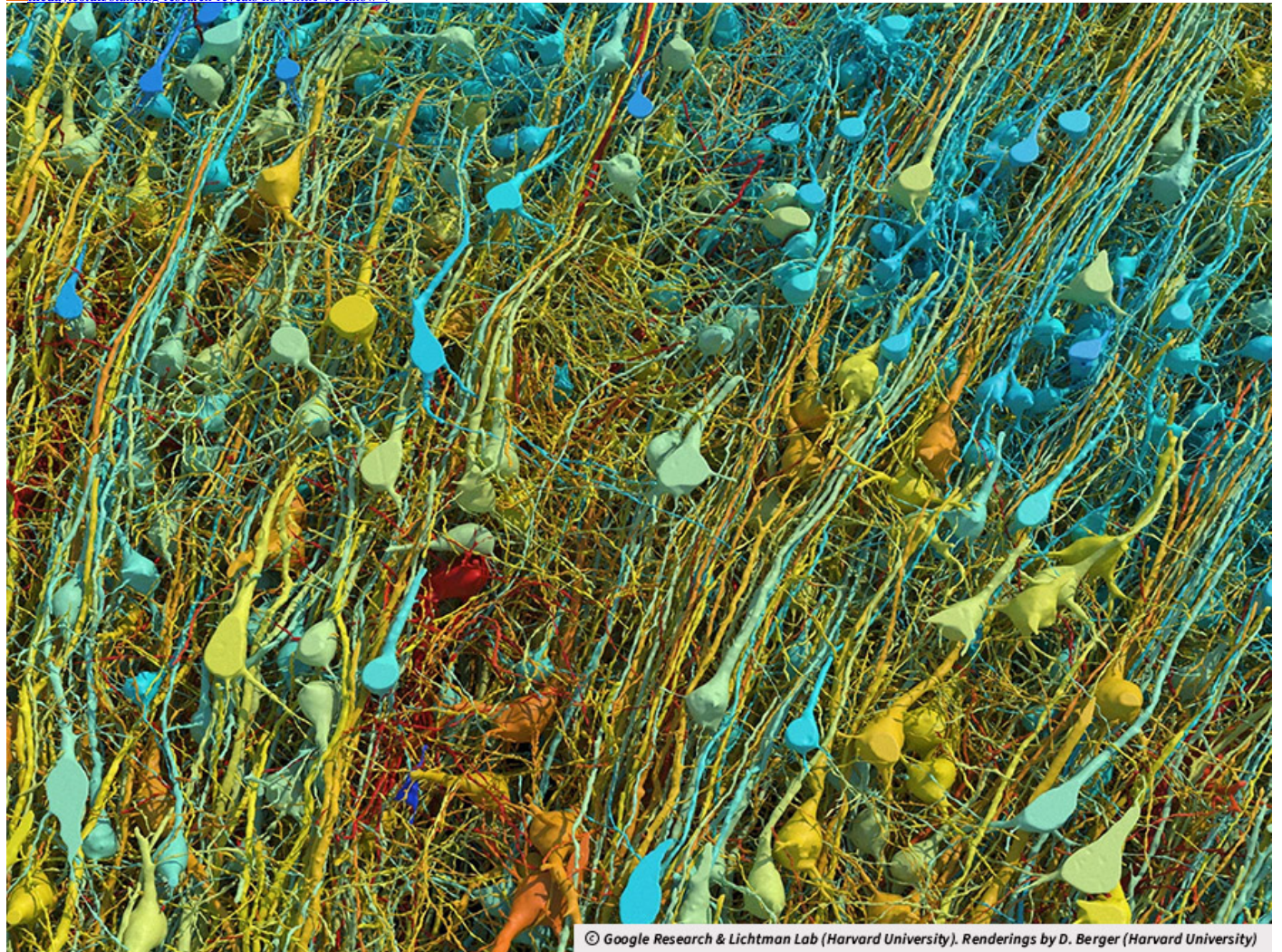


Stunning research reveals how little we know

[D theday.co.uk/stunning-research-reveals-how-little-we-know-4](https://www.theday.co.uk/stunning-research-reveals-how-little-we-know-4) 13 May 2024



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Spectacular: Scientists modelled a cubic millimetre of brain revealing new patterns and links (above).

Is this the dawn of a new age of discovery? Scientists in America have made a map of a tiny part of the human brain, and their findings are mind-blowing.

What's happening?

At last the complex map was complete. "I remember this moment," says Viren Jain, a **neuroscientist** who works for Google. It felt, he adds, "sort of spiritual."

He was looking at a tiny piece of a woman's brain — roughly the size of a sharpened pencil point. But scientists managed to cut it into 5,000 slices, each 34 nanometres thick. That is about as much as a fingernail grows in 30 seconds.

Find out more

A picture was taken of each slice using a special **microscope**. Then Viren Jain put all the photographs together and used them to create a 3D map.

The map covered roughly one millionth of the brain. It showed around 57,000 cells and 150 million of the connections between nerve cells (also known as **neurons**) known as synapses.

The map also revealed some amazing things about neurons. There were pairs that were almost mirror images of each other. And some had **tendrils** that formed knots around themselves.

The map is a triumph of science. But at the same time, writes David Von Drehle in *The Washington Post*, it is "awe-inspiring" because it shows us what we do not know. The map shows that we are nowhere near a basic understanding of how the brain works.

But rather than lose hope of ever understanding the world, we should be excited:

"The age of discovery is only beginning, and its **duration** is limited only by our willingness to learn and grow. To see the miraculous tangle of connections... is to find nearly **infinite** possibility and to feel a surge of hope."

Is this the dawn of a new age of discovery?

Some say

Yes! The making of the map is an amazing achievement. So are new **telescopes**, and new discoveries thanks to **Artificial Intelligence**.

Others think

No! Most of the big discoveries — for example, electricity or new medicines — have already happened. We can only make small discoveries now.

Some people say

"A theory can be proved by experiment; but no path leads from experiment to the birth of a theory."

Albert Einstein (1879 – 1955), German physicist

What do you think?

Six steps to discovery

1. Connect

How do you feel about this story? - Would you like to be a scientist?

2. Wonder

What questions do you have? - For example: Who worked out the different parts of the brain? How were neurons discovered?

3. Investigate

What are the facts? - Pick out one thing we know for certain from this story and one thing we cannot say for sure.

4. Construct

What is your point of view? - Someone asks you if this is an exciting time to be alive. Think about what you would say.

5. Express

What do others believe? - Which is more important – exploring the human brain or exploring space? Talk about it with your classmates.

6. Reflect

What might happen next? - Imagine you wake up to discover that your brain has been put into someone else's body. Write a story about it.

Glossary

Neuroscientist - Neuroscience is the study of the brain and nervous system. There is a lot of overlap between neuroscience and psychology, but neuroscientists tend to focus more on the way that nerves function.

Microscope - An object that uses lenses to make very small objects look much bigger.

Neurons - Neurons, also known as nerve cells, are cells in the nervous system that use chemical or electrical signals to transmit information throughout the body.

Tendrils - Something that is thin and curly — often the stem-like parts of climbing plants that attach themselves to walls.

Duration - The length of time something lasts.

Infinite - Limitless or endless. An amount impossible to count.

Telescopes - Devices which makes things look nearer than they are.

Artificial Intelligence - Artificial intelligence, or "AI," is the ability for a computer to think and learn. With AI, computers can perform tasks that are typically done by people, including processing language, problem-solving, and learning.