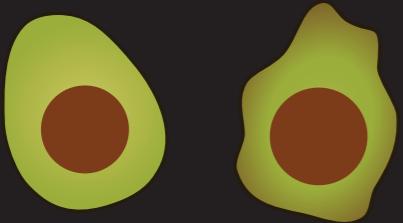


Combs in real life



Health

When we buy avocados, we can tell how ripe they are by how squishy they feel. These textural differences are caused by mechanical changes in the cells of the fruit.

Our bodies are similar. Think of when you've fallen over and gotten a bruise, the skin (and tissue underneath) feels and looks different to how it normally does.

Scientists can use the light from combs to squish tissue and detect mechanical changes to help diagnose disease. In the future, they hope microcombs could be put into smart phones so doctors could conduct non-invasive tests from anywhere using the power of light.



Space

Astronomers are using astrocombs – combs that measure the light produced by stars – to uncover the wonders of the universe. This includes searching for Earth-like planets.

Stars wobble a tiny amount if a planet is orbiting around them. Using astrocombs, scientists can detect these wobbles to help them identify distant planets like our own.

In the future, astronomers want to use small and stable microcombs to conduct long-term experiments. This includes a 50-year study to see how the universe expands in real-time by detecting changes in the sky.

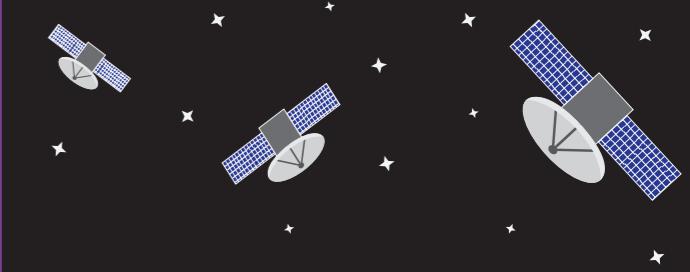


Connection

When we use the internet, information is sent from our devices to servers via fibre optic cables in the ground. These cables use laser light to send this data at very high speeds.

However, as the world uses more data for things like AI, GPS map directions, and streaming, our existing cables need a speed boost to keep up.

Scientists are using microcombs to boost the capacity of fibre optic cables by increasing the number of frequencies made by one device. One test found they could send over 40 terabytes of information – or thousands of movies – in one second, with a single microcomb. With more research, microcombs could help support our internet needs for years to come.



Travel

We use systems like GPS (Global Positioning System) every day to help us work out where we are and how to get to new places. GPS works by using super-accurate clocks on satellites floating 20,000km above the Earth.

GPS isn't just used for navigation, it also helps run things like the internet, electricity, banks and even traffic lights. If GPS signals are disrupted by bad space weather or people trying to block the signal, many parts of our lives would stop too.

That's where microcombs come in. Using tiny beams of light, scientists are developing super-precise measurement systems that will still work even if GPS fails, to keep the world running smoothly.