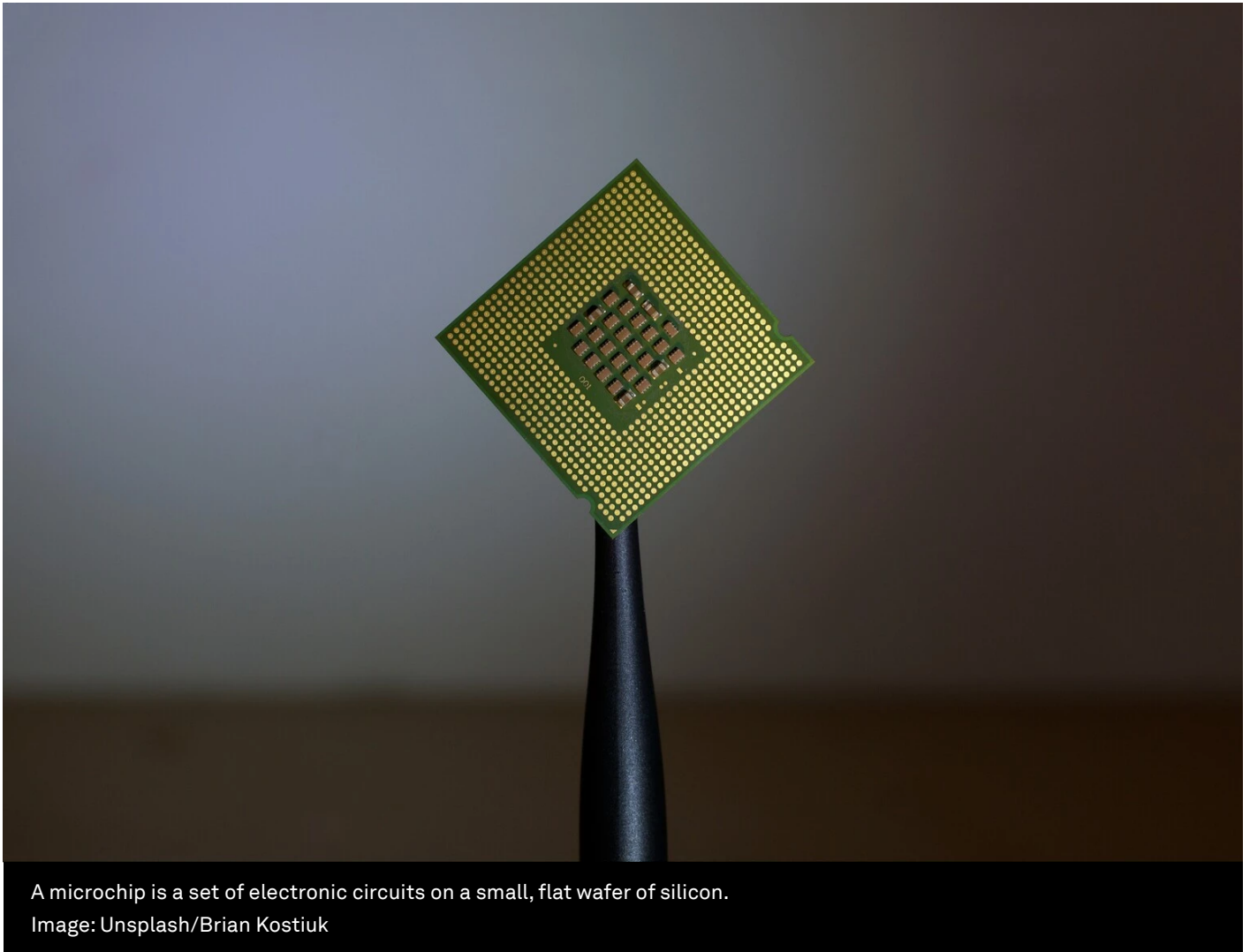


Microchips – their past, present and future

Mar 27, 2024



A microchip is a set of electronic circuits on a small, flat wafer of silicon.
Image: Unsplash/Brian Kostiuik

Victoria Masterson

Senior Writer, Forum Agenda

- Tech company Nvidia has unveiled a new artificial intelligence (AI) chip that can perform some tasks 30 times faster than before.

- **Microchip history began in 1947 with the invention of the transistor and today is being advanced to meet the growing power and energy needs of AI technologies.**
 - **Both generative AI and sustainable computing make the World Economic Forum's Top 10 Emerging Technologies list.**
-

Microchips are entering a whole new world of possibility.

Artificial intelligence (AI) and its vast need for power and speed is driving a new generation of microchip innovations. Examples include the [AI chip just unveiled by Californian technology corporation Nvidia](#).

The company says the chip can do some jobs 30 times faster than its predecessor, reports the BBC.

It has also introduced a line of chips designed to run chatbots in cars and discussed chips that can create humanoid robots.

So, what are microchips and how have they changed our world?

What are microchips?

A [microchip is a set of electronic circuits](#) on a small, flat wafer of silicon, explains semiconductor specialist ASML.

Silicon is hard and brittle, like crystal, and is the second most abundant chemical element on Earth after oxygen. It is made from sand and has unique electrical and thermal properties for chip manufacture.

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A brief history of microchips

An important date in the history of the microchip is 1947, when the transistor, a key precursor to the microchip, was invented at Bell Labs, an American telecoms research and development company known for its pioneering innovations.

Transistors are essentially tiny switches that turn electrical currents on or off. Today, [a tiny chip can hold many billions of transistors](#), explains the BBC's Made on Earth series.

Then in 1958, an electrical engineer at electronics company Texas Instruments, Jack Kilby, [created the first integrated circuit](#). This was a foundational

breakthrough for modern microchips, according to electronics news site, Electropages.

Have you read?

- [Everyone wants this pricey chip for their AI. But what is it?](#)
 - [How to balance regulating semiconductors with global security and technological progress](#)
 - [When the chips are down: How the semiconductor industry is dealing with a worldwide shortage](#)
-

Integrated circuits are small electronic chips made up of interconnected components, including transistors.

Another critical innovation followed in 1959 when physicist Robert Noyce developed the first practical integrated circuit, made in one piece, that could be mass-produced.

In the early 1960s, NASA helped to drive the development of microchip technology as an early adopter.

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How have microchips changed the world?

Without microchips, everyday technology – [from the internet to handheld calculators](#) – would be the stuff of science fiction, suggests news site Slate.

Microchips have brought increasingly smaller, more powerful and more efficient electronic devices.

For example, ultrasound scanners are typically large machines wheeled around on trolleys in hospitals and clinics. [Shrinking microchip technology means they're now available as pocket-sized mobile devices](#), Texas Instruments says.

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A new dawn for microchips

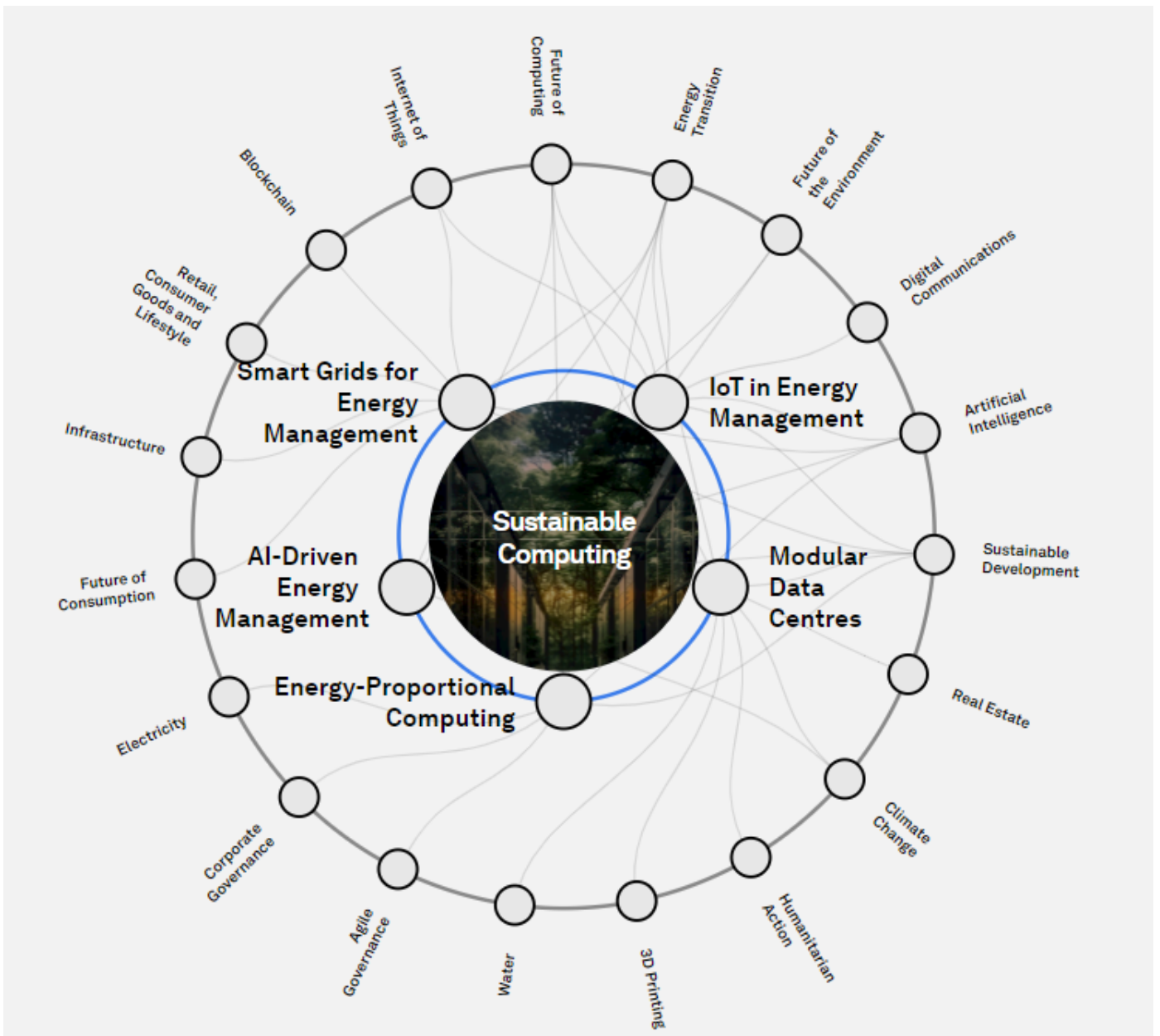
Scientists are unlocking next-generation advances in microchip technology by using particles of light to carry data – instead of electricity.

Boston-based startup Lightmatter, for example, is using [light to multiply the processing power and cut the huge energy demand of chips](#) used in AI technologies.

[Light is way more energy efficient in transmitting information](#) than electrical signals travelling over wires, the company tells Reuters.

German startup, [Semron, is developing a chip to run AI programs](#) locally on smartphones, earbuds, virtual reality headsets and other mobile devices, explains news site TechCrunch.

Instead of electrical currents to perform calculations – the conventional way that computer chips have worked – Semron's chips use electrical fields. This improves the energy efficiency and cuts the manufacturing cost of the chips, the company says.



Sustainable computing looks at how to tackle the growing energy demand of data processing. Image: World Economic Forum

AI and other technologies shaping our future

Generative AI and sustainable computing are two emerging technologies explored in the World Economic Forum’s [Top 10 Emerging Technologies of 2023](#) report.

Right now, [generative AI is still mostly focused on producing text](#), computer programming, images and sound, the report explains. In the future, however, it could have applications in drug design, space travel, food production and other industries.

For example, NASA is looking at AI systems that can build lightweight spaceflight instruments 10 times faster than currently, but with improved structural performance.

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[Sustainable computing looks at how to address the spiralling energy demand of data processing](#) as technologies multiply and advance.

From Google searches and sending an email to using AI or metaverse applications, the data centres processing these requests consume an estimated 1% of the electricity produced globally, the Forum says. And this will only increase as people and technologies drive more demand for data.

And we could soon see net-zero data centres, created by using AI and other technologies to reduce their energy consumption and efficiency.

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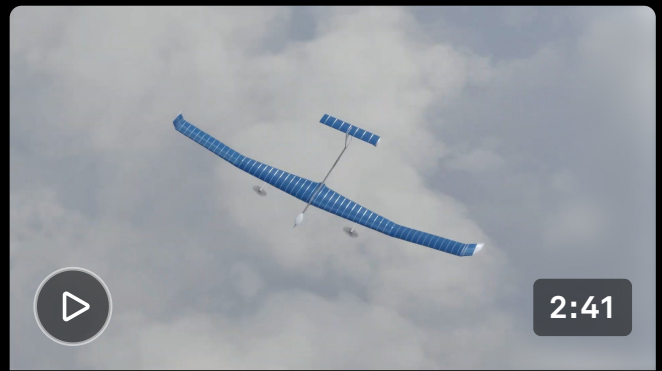
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