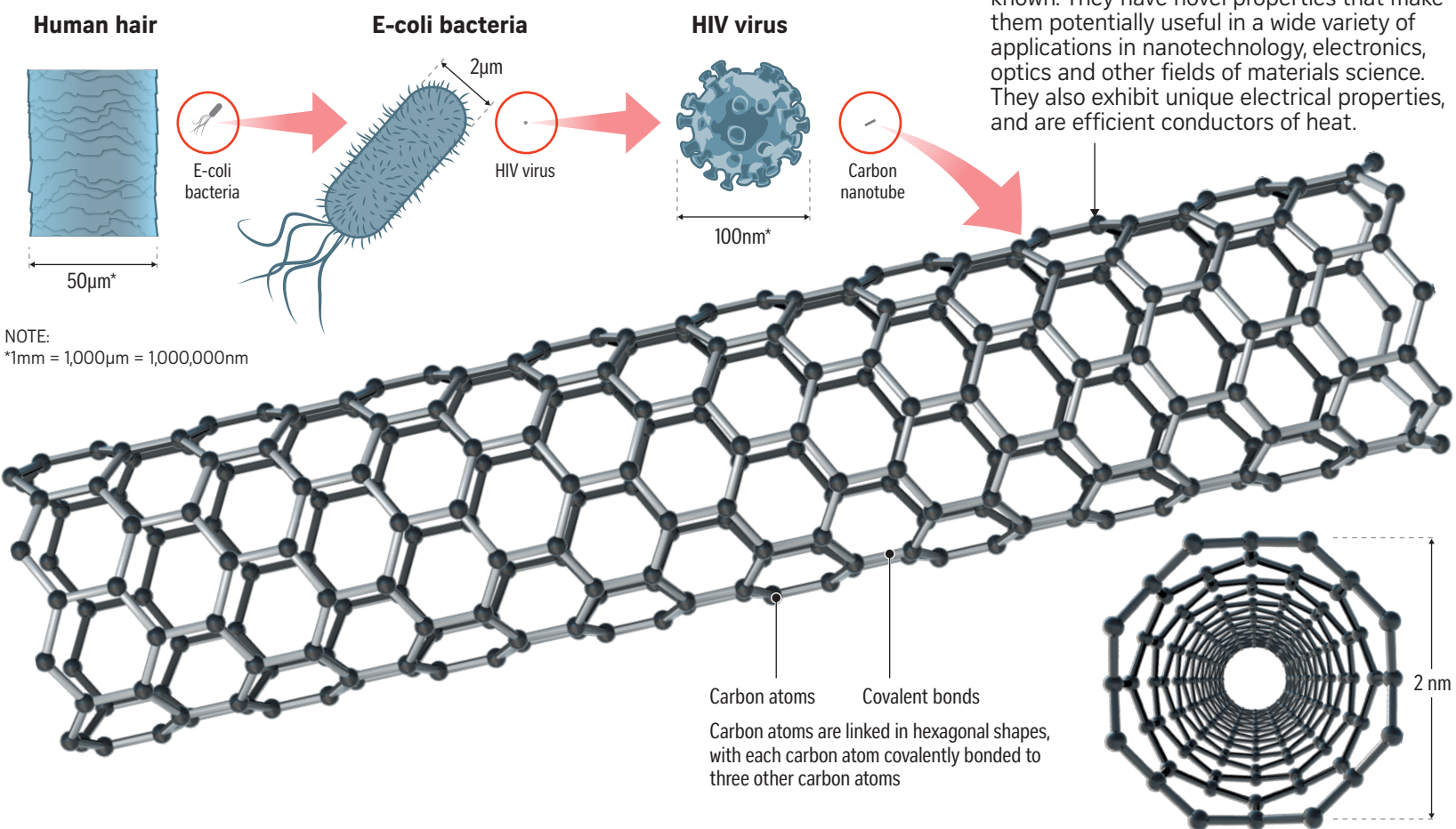


How small can be powerful

Nanotechnology is transforming the way we do things, from curing disease to building skyscrapers. Lin Yangchen looks at examples of how nanotech is used in sectors similar to those identified by the National Research Foundation for large-scale funding, to the tune of \$19 billion in the next five years.

WHAT IS NANOTECHNOLOGY?

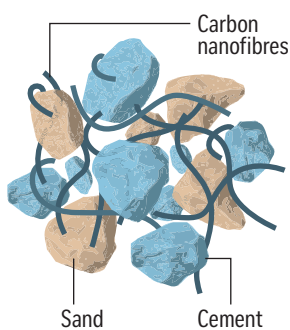
It is science, engineering and technology at scales going down to as small as a billionth of a metre.



INDUSTRIES USING NANOTECHNOLOGY

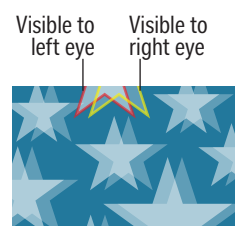
MANUFACTURING

- Carbon nanofibres with special chemical properties have been incorporated into concrete. They bind the concrete particles more strongly, making the concrete more durable and four to six times stronger without increasing its weight.
- This could be useful for harsh environments or for strengthening structures.



INFORMATION TECHNOLOGY

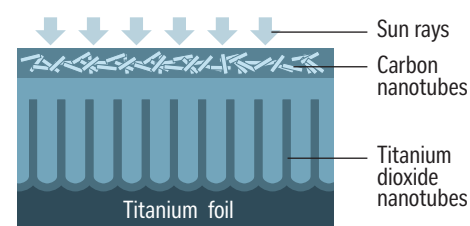
- Overlapping ultra-high-resolution images have been printed at 62,500 dots per inch, which produce a three-dimensional effect under a microscope when viewed through a pair of polarisers.
- This technology has potential security applications in banknotes and product authentication stickers.



Overlapping images

RENEWABLE ENERGY

- Two different kinds of nanotubes, made of carbon and titanium dioxide, have been used in the fabrication of solar cells, making them flexible and less bulky than conventional solar panels.
- They can be bent to and fro up to 100 times with little deterioration in performance.



Solar cells

BIOMEDICAL SCIENCE

- A substance extracted from green tea leaves — epigallocatechin gallate — has been incorporated into cancer drug nanoparticles, making them more selective in targeting cancer cells, requiring smaller doses and reducing side effects and cost.
- A spin-off company, GreenT Biomed, has been set up to commercialise the product.

