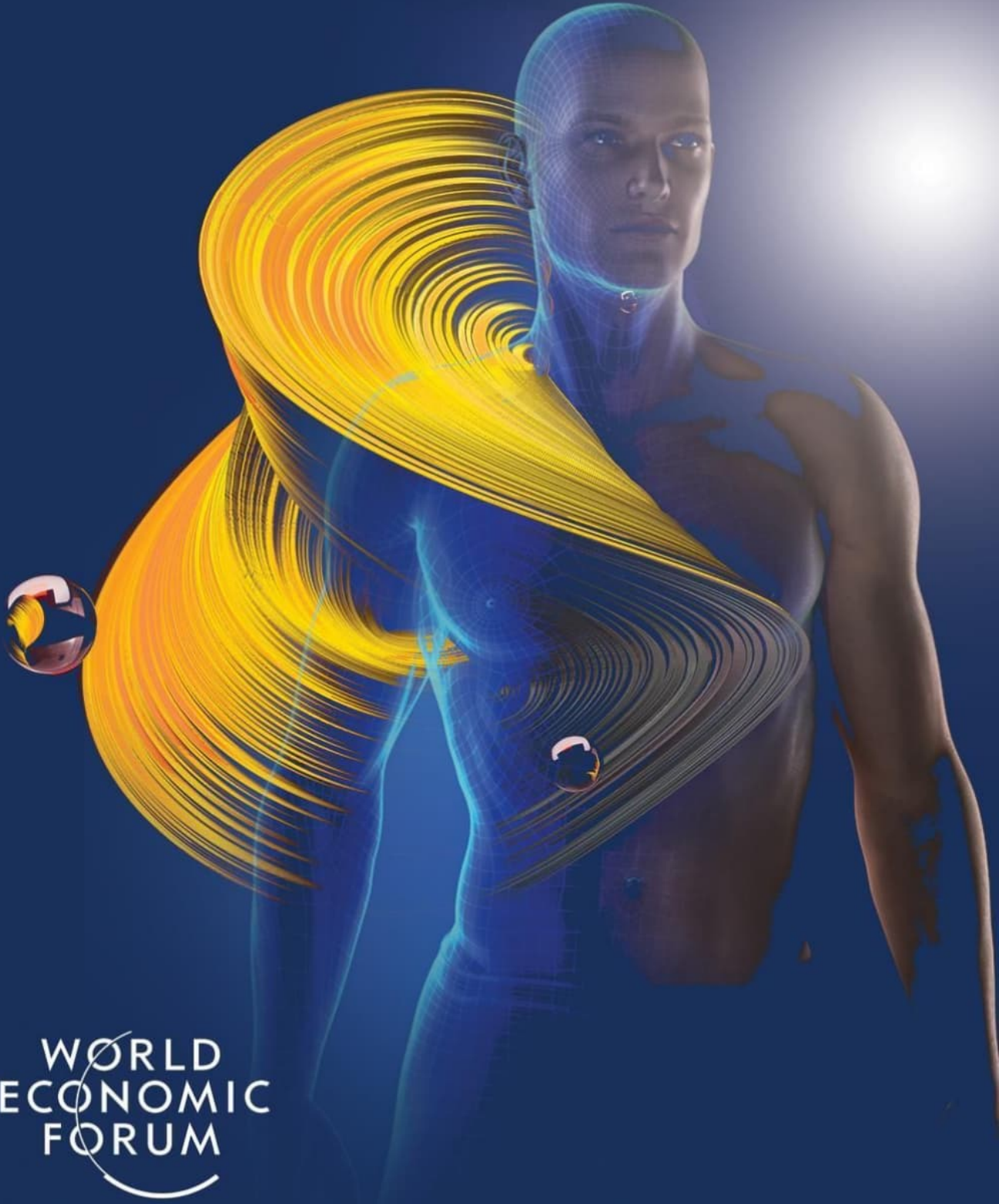


# WHAT ARE THE TOP 10 EMERGING TECHNOLOGIES OF THE YEAR?



WORLD  
ECONOMIC  
FORUM

2020 REPORT

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SWIPE LEFT TO KNOW

# MICRONEEDLES FOR PAINLESS INJECTIONS & TESTS

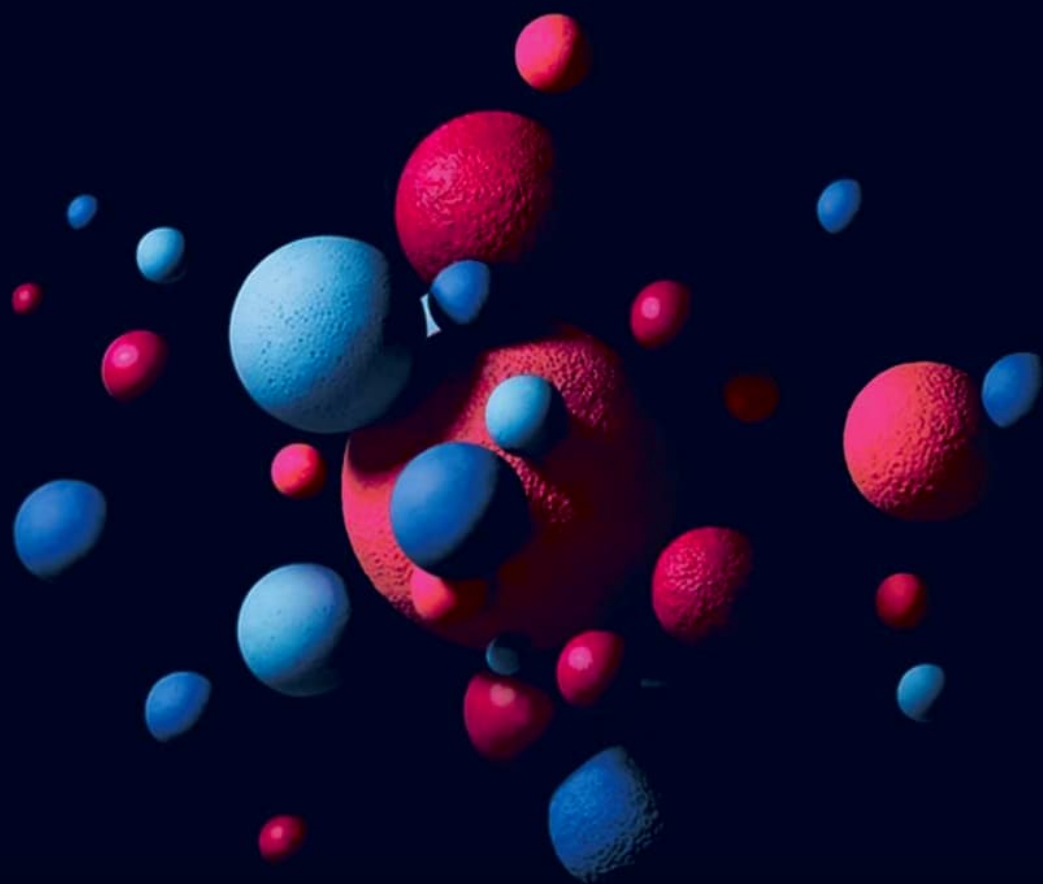


In Medicine

Microneedles prevent pain by avoiding contact with nerve endings and are typically about the width of human hair.

This technology is already available for administering vaccines and is being used in clinical trials for treating diabetes, cancer and neuropathic pain.

# SUN-POWERED CHEMISTRY

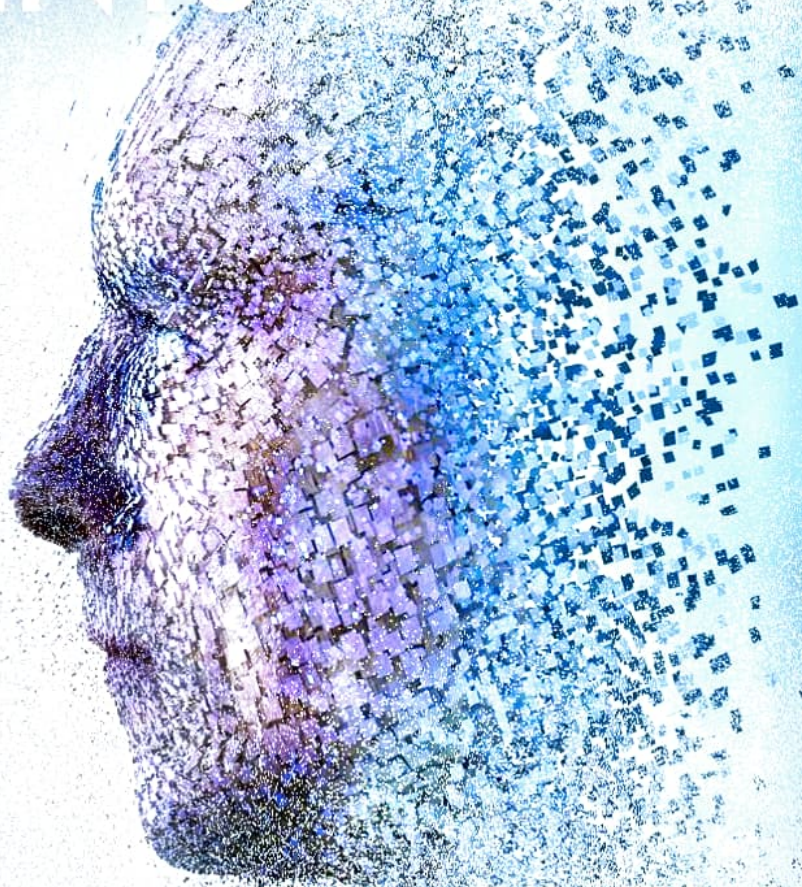


In Chemical Engineering

Manufacturing chemicals consume fossil fuels that contribute to CO<sub>2</sub> emissions.

Sun-powered chemistry employs sunlight to convert waste CO<sub>2</sub> into the needed chemicals, creating molecules that can serve as raw materials for the synthesis of medicines, detergents & fertilizers.

# VIRTUAL PATIENTS



# InHealthcare

“In silico medicine” or testing of drugs on virtual organs predict how a real person will respond to the therapies. Replacing humans with simulations could also make clinical trials faster and safer.

The FDA is already using computer simulations for evaluating new mammography systems.

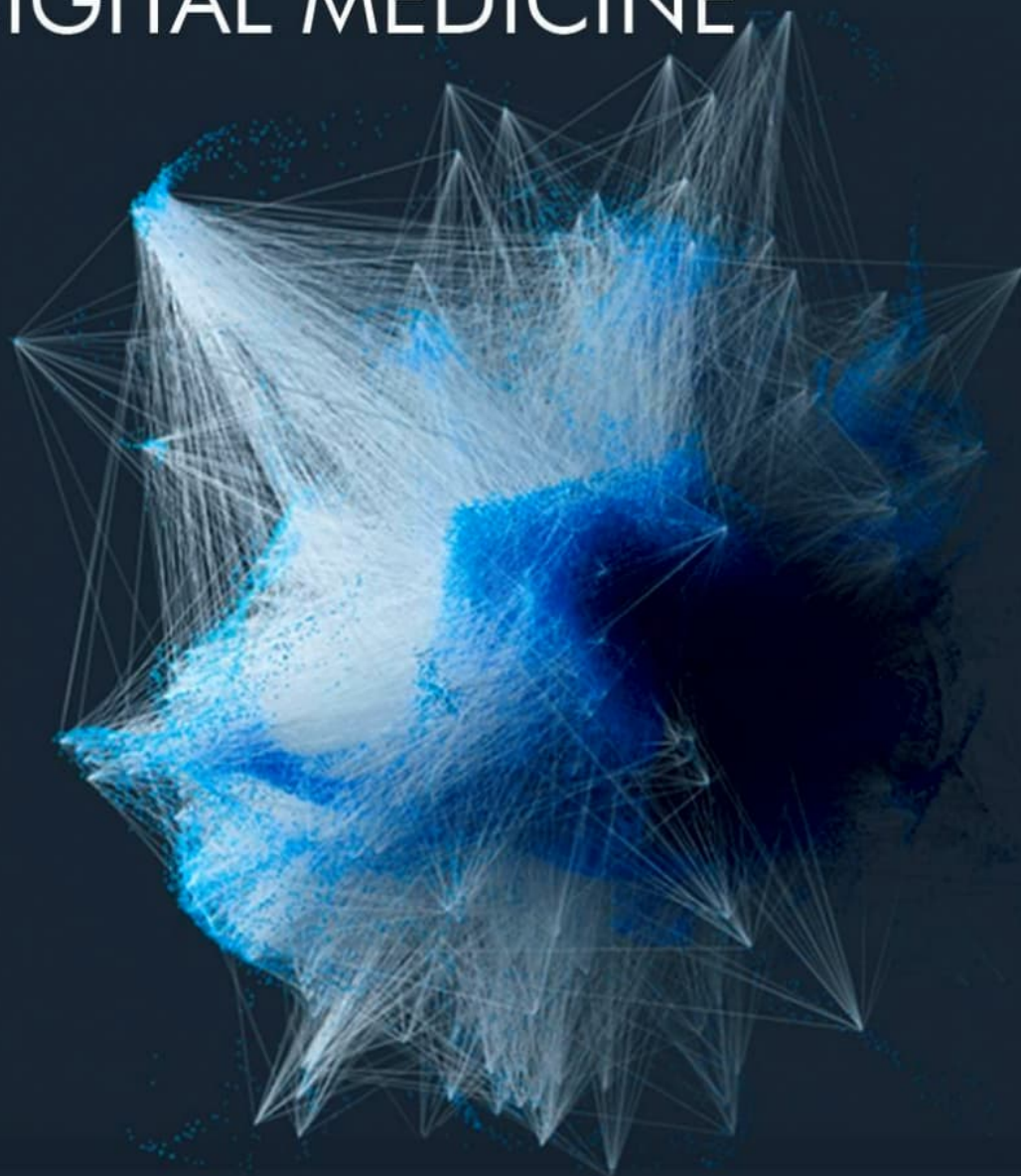
# SPATIAL COMPUTING

In Computing

'Spatial computing' does everything virtual reality & augmented reality apps do: digitize objects that connect via the cloud; allow sensors and motors to react to one another; and digitally represent the real world.

Major companies, including Microsoft and Amazon, are heavily invested in this.

# DIGITAL MEDICINE

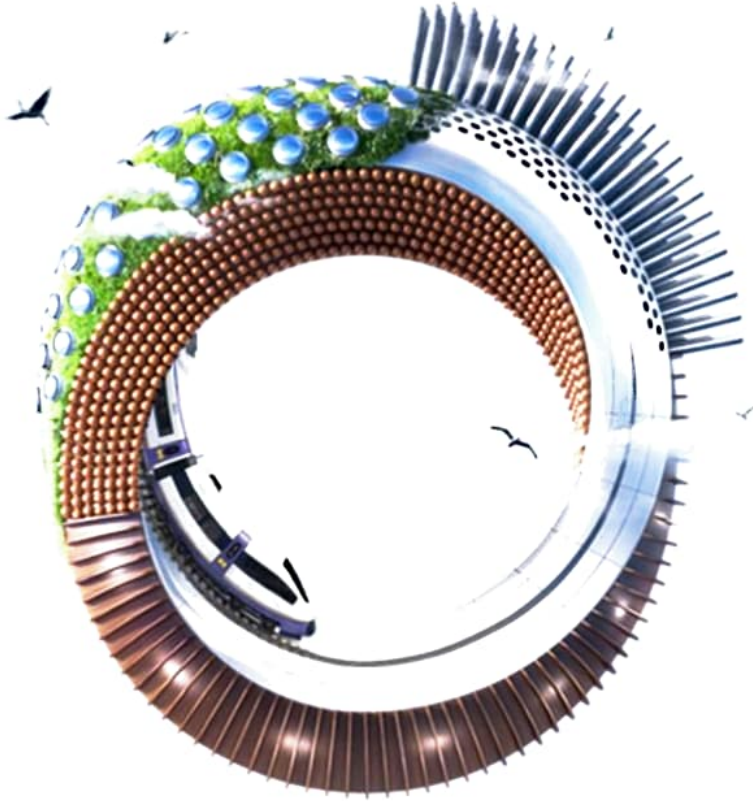


In Medicine

Apps can now detect mental and physical disorders. Known as digital medicines, they can both enhance traditional medical care and support patients.

The COVID-19 outbreak highlighted their importance. By April, AI bots had already fielded more than 200mn inquiries about COVID symptoms & treatments.

# ELECTRIC AVIATION

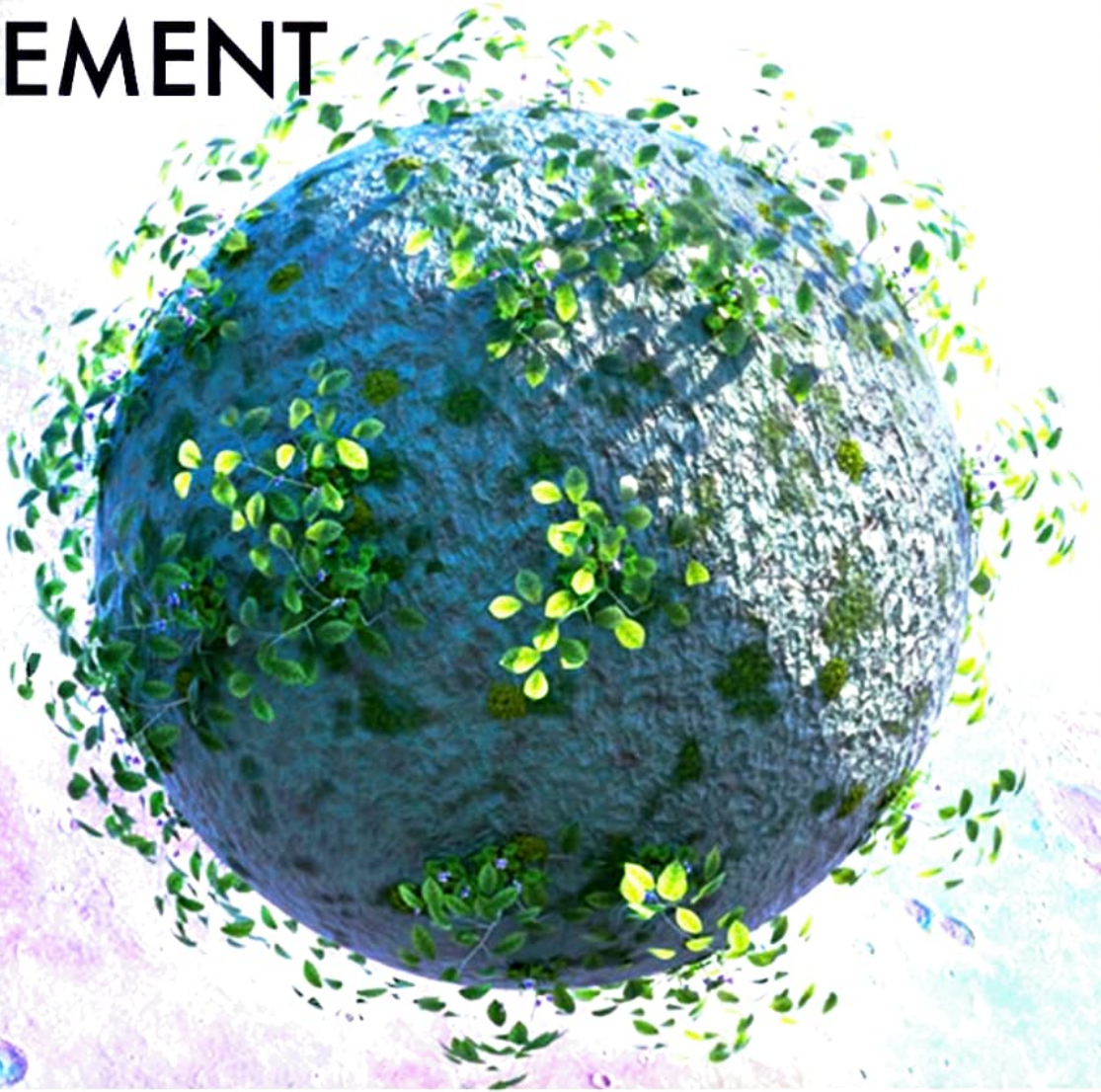


In Transportation

With electric aviation, companies intend to eliminate direct carbon emissions and reduce fuel costs by up to 90%. Electric propellers also increase lift during take-off, allowing for smaller wings and overall higher efficiency.

Companies working on electric flight are Airbus, Ampaire, MagniX and Eviation.

# LOWER-CARBON CEMENT



Manufacturing cement creates up to 8% of human-produced carbon dioxide.

Which is why a variety of lower-carbon approaches are being pursued.

Start-up Solidia is employing a chemical process that has cut 30% of the carbon dioxide usually released in making cement.



# QUANTUM SENSING



In Computing

Quantum sensors could be transformative in enabling underwater navigation systems, early-warning systems for volcanic activity, portable scanners that monitor a person's brain activity and more.

Industry analysts expect them to reach the market in the next 3-5 years.

# GREEN HYDROGEN


In Energy

Green hydrogen is produced through electrolysis, in which machines split water into hydrogen and oxygen, with no other by-products.

Companies are developing electrolyzers that can produce green hydrogen cheaply. Energy companies are also starting to integrate electrolyzers into renewable power projects.

# WHOLE-GENOME SYNTHESIS

In Synthetic  
Biology



Researchers use software to design genetic sequences that they introduce into a microbe, thereby reprogramming it.

The ability to write our own genome will enable doctors to cure many genetic diseases. Genome Synthesis could also be engineered to sustainably produce chemicals, fuels.