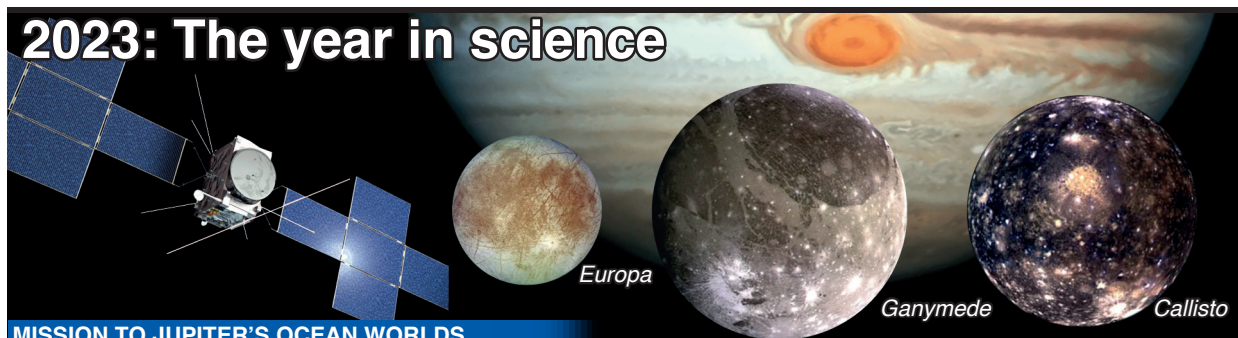


2023: The year in science



Europa

Ganymede

Callisto

MISSION TO JUPITER'S OCEAN WORLDS

APRIL: ESA's Jupiter Icy Moons Explorer, *Juice*, blasts off to make detailed observations of the giant gas planet and its three large ocean-bearing moons – *Europa*, *Ganymede* and *Callisto* – with a suite

of remote sensing instruments. The mission will characterise these moons as planetary objects and possible habitats for life. *Juice* will arrive at Jupiter in 2031

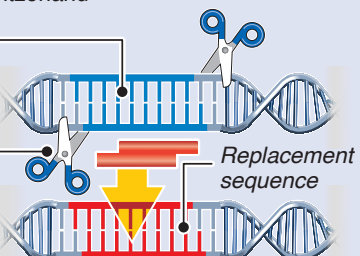
CRISPR GENE-EDITING MARVEL

NOVEMBER: In a world first, the UK medicines regulator approves a therapy that uses **CRISPR-Cas9** gene-editing as a treatment for sickle-cell disease.

CASGEVY (*exagamglogene autotemcel*) is a first-of-its-kind treatment made by Vertex Pharmaceuticals and CRISPR Therapeutics in Zug, Switzerland

CRISPR-Cas9*: Edits faulty gene in stem cells isolated from bone marrow

Genetic scissors: Replace DNA of cells so that the body produces functioning haemoglobin



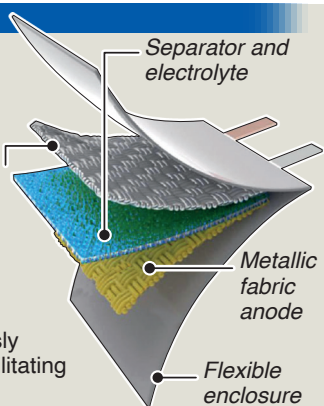
*Clustered Regularly Interspaced Short Palindromic Repeats

FLEXIBLE BATTERIES

JUNE: A new generation of flexible batteries may allow the seamless integration of technology into clothes.

Metallic fabric cathode

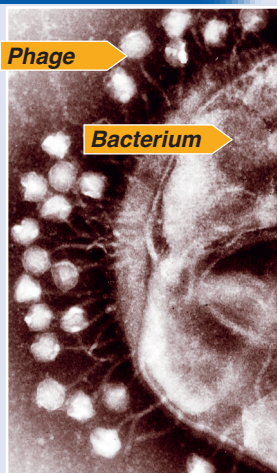
The ability to be bent, twisted and stretched makes them ideal for wearable medical devices and biomedical sensors. Health-related applications could transmit data wirelessly to healthcare providers, facilitating remote patient monitoring



PHAGES-BASED BIOCONTROL OF BACTERIA

JUNE: The number of microbes living on and within the human body can exceed the number of human cells. Advances allow engineering of **phages** to benefit human well-being and augment agricultural productivity.

Upon infection, a phage deploys a syringe-like device to inject its DNA into the bacterium. Bioengineered phages can change a host bacterium's functions, causing it to produce a therapeutic molecule or to become sensitive to a certain drug



AI TEXT-TO-IMAGE TECHNOLOGY

APRIL: Artificial intelligence software can generate artwork in seconds using just a few text prompts.

All image generators use images, patterns and captions found on the internet to help learn how to use a text prompt to create visuals

Copyright: Artists and photographers claim AI uses their work without consent

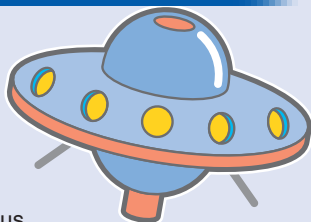
AI-generated image (left) and original image by animal photographer Tim Flach



SCIENTISTS GET SERIOUS ABOUT UFOS

OCTOBER: The Pentagon reports 274 **Unidentified Anomalous Phenomena (UAP)** sightings from Aug 2022 to Apr 2023.

Harvard's **Galileo Project** collects high-quality data on UAPs, capturing continuous video of the sky in infrared, optical, and radio bands.



NASA has created a UAP study team and **Enigma Labs** has developed a smartphone app offering a repository of 270,000 UAP sightings over the past century

FUSION – ENERGY OF THE FUTURE

JULY: Scientists at Lawrence Livermore National Laboratory in California generate a burst of energy by bombarding a pellet of hydrogen with 192 lasers, reproducing for a brief moment the process of fusion that powers our Sun.

The experiment generated 3.88 megajoules (MJ) of energy after the lasers delivered 2.05MJ to the target – 89% more energy came out of the target than went into it

