

Innovations to look out for in 2020 and beyond

BY DON STEINBERG

Mushroom couture

Fashionable leather-like garments of the future may be grown from mushrooms. Companies like San Francisco's MycoWorks are pioneering eco-friendly alternatives to animal hides that can be easily dyed, textured and sewed.



FUTURE FACTS



Accessorize for health

A growing wardrobe of wearable health sensors—from pulse-monitoring earrings to skin-sensing tattoos—will monitor our vital functions around the clock. In the future, they could work with communicating apps that store our genetic profiles, helping doctors and AI systems detect irregularities, predict disease risks and customize medicines.



BIGGER THAN A THUMB DRIVE

DNA packs information so tightly that researchers have suggested it could store the Internet in a shoebox. Microsoft and others are developing ways to convert digital data into synthetic DNA built out of four bases of the genetic code.

FLYING SOLDIERS

After enabling short-hop human solo flight with their jet-pack bodysuit, the personal-flight pioneers at England's Gravity Industries recently demonstrated a version of the suit with a shoulder-mounted, helmet-controlled air rifle. (The company declined to say whether it is working with a military on the project.)

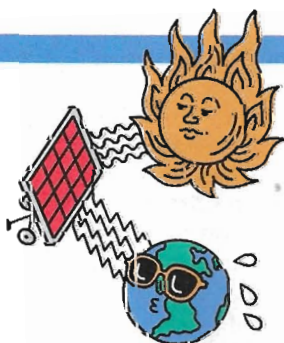


HEY UMP, GET A NEW LENS!

Major League Baseball could try out an electronic strike zone within the next five seasons, which would use Doppler radar to call balls and strikes and relay them to human umpires on the field. Last year, an independent minor league became the first to test the system, and in December, the Major League Baseball Umpires Association agreed to cooperate if the automated system is called up to the big leagues.

STEALING EXTRA SUNSHINE

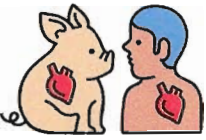
Orbiting power stations in space could capture solar energy 24 hours a day, convert it to electricity and beam it to earth via laser or microwave antenna. The technology may be cost-effective by the 2040s, according to the International Academy of Astronautics.



ONLINE DATING ALTERS HUMAN EVOLUTION

Algorithms that help match mates on dating services are shaping new generations of humanity. Studies show about 40% of heterosexual couples meet online today, and one estimate forecasts half of babies born in 2037 will be to couples who first connected on the Internet.





THE FASTEST RIDE ON LAND

Multiple global companies are developing Hyperloop projects that can shoot passenger trains through tubes at more than 600 m.p.h. That's New York City to L.A. in under five hours, or to D.C. in 30 minutes. Services could go commercial by the 2030s, enabling extreme work commutes.



Human parts from animals

Chinese scientists recently bred piglets born with monkey cells in them. Researchers from California's Salk Institute created embryos containing both human and monkey cells. These and other similar sci-fi-sounding experiments are aimed at creating transplantable human organs, which are often in short supply.



VIRTUAL-REALITY GOGGLES FOR SENIORS

Virtual-reality headsets may become common in senior living facilities, allowing residents to simulate traveling and interact with memory-stimulating audiovisual content. More than 1 in 5 Americans will be over age 65 by 2040.



SPORTS ARENAS AS CASINOS

Washington, D.C.'s Capital One Arena—home to NBA, WNBA and NHL teams—is set to become the first professional U.S. sports facility to have a sports-betting operation inside the building. With sports gambling legalized in D.C. and some states, leagues and team owners will want a piece of the multibillion-dollar action, and wagering on player performance at the game could become as common as buying hot dogs.

Collecting space junk

Defunct satellites and bits of other debris in low earth orbit pose a hazard to communications equipment and future exploration. So it's cleanup time. The European Space Agency plans to launch a robotic vacuum cleaner into orbit in 2025, and private companies like Japan's Astroscale are developing debris-scooping equipment.



MORE CAR-FREE ZONES

Many city centers, islands and historic villages around the world restrict cars. Culdesac Tempe may be the first of many built-from-scratch neighborhoods in the U.S. to forbid private cars completely when it opens this year. The Arizona development will allow scooters, bikes and visiting ride-sharing services, and there will be access to light-rail transport.

AT HOME AT THE MALL

As brick-and-mortar retail weakens, more owners will repurpose malls into housing/shopping/dining complexes, eyeing demographic shifts that could create the need for millions of new senior housing units in coming years. Transformations have begun at the vacant Four Seasons mall outside Minneapolis, Skyview on the Ridge in Irondequoit, N.Y., and others.

Scrubbing the seas

Forecasts predict that by the mid-2000s, there will be more plastic than fish in the sea, along with numerous waterborne chemicals that can affect health and the environment. Early efforts to create a scalable cleanup solution finally bore fruit in 2019 and could start to have a real impact in the next decade.

