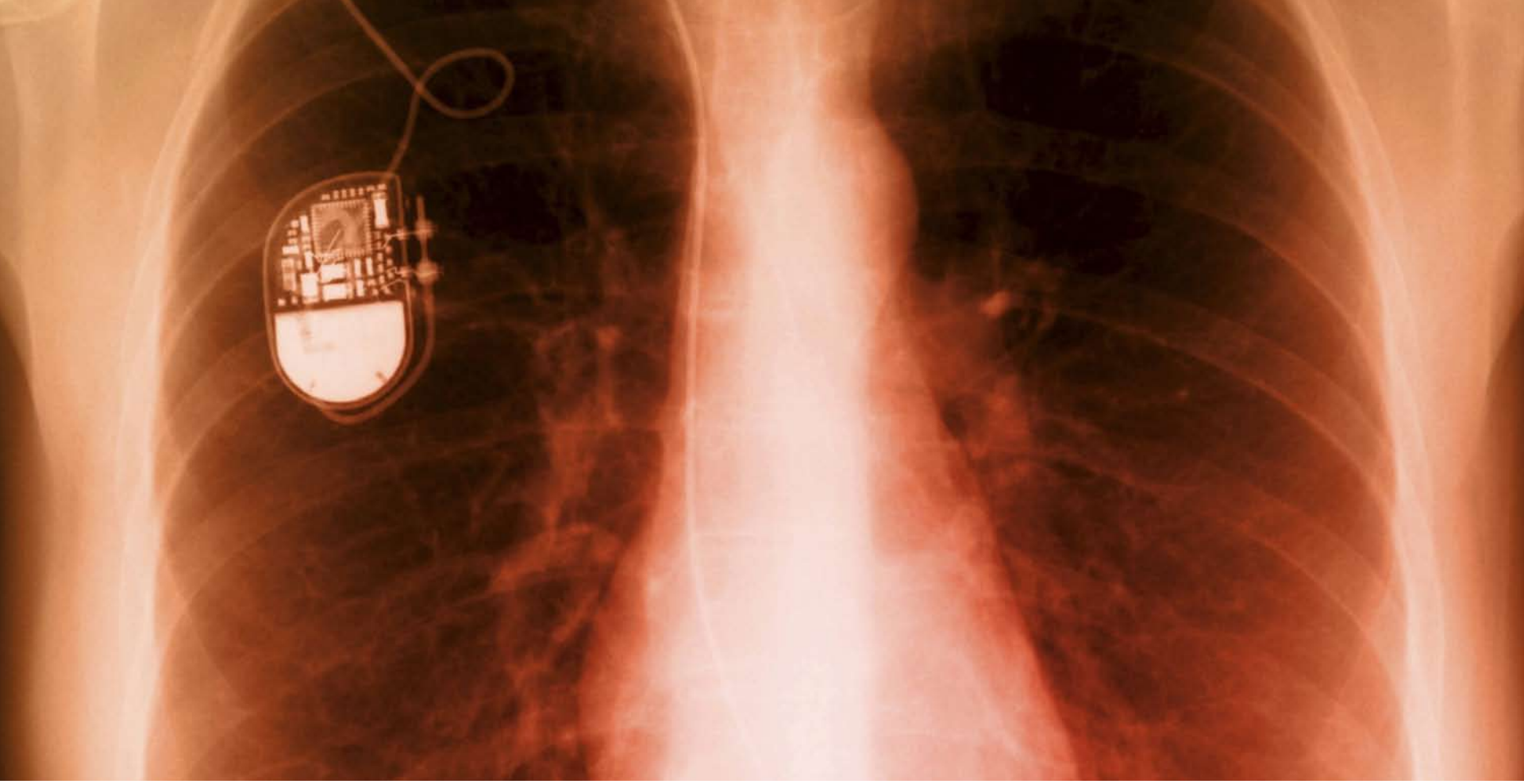
From NASA TO Life

Technologies originally developed or utilized by NASA often transcend their initial objectives and reappear as innovative commercial materials or products that improve the lives of human beings each and every day. Check out these examples and see how NASA brings space-age technology to real life.



Matters of the Heart

Telemetry systems originally designed to monitor astronauts and spacecraft laid a foundation for the technology used in heart patients' pacemakers. Moreover, NASA satellite communication technology provided the springboard that permits doctors to monitor and adjust implanted pacemaker functions from outside the human body.
Photo reprinted with permission from the Heart Rhythm Society.

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Forever Fresh

In order to grow plants in confined spaces like the Space Shuttle, a system to remove ethylene (a natural hormone that, in excess, causes plants to wither) is necessary. This NASA-sponsored technology can also be used to increase the shelf life of fruits, vegetables, and flowers in storage units and display cases.

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Liquid Metal

Through a NASA-funded research project, a vitrified metal called Liquidmetal® alloy (also known as metallic glass) was strengthened and improved upon. With the structure of glass, the elasticity of a polymer, and a strength more than twice that of titanium, Liquidmetal is uniquely suited to the manufacture of sports equipment, jewelry, medical instruments, car parts, military equipment, and other beneficial products.

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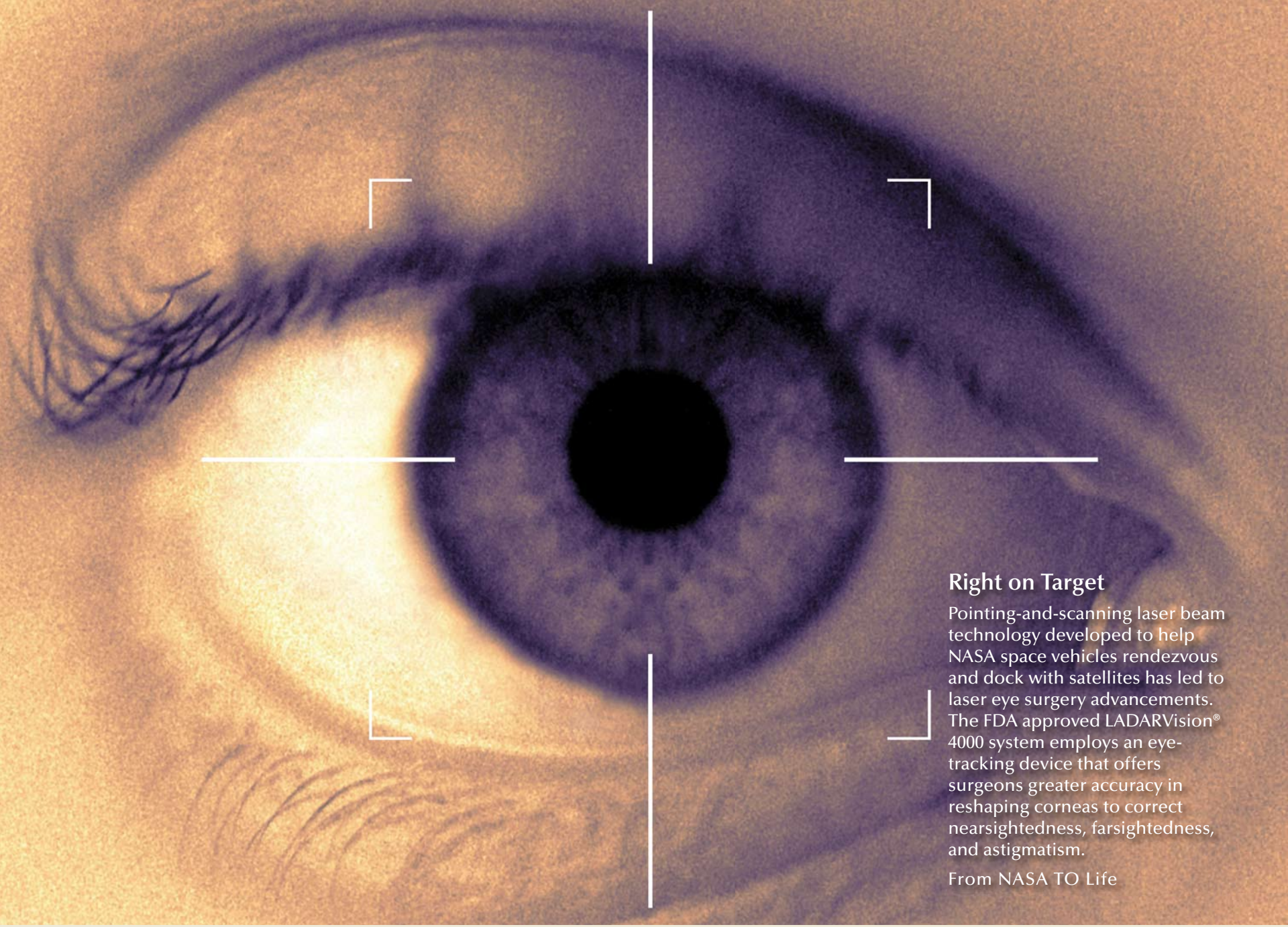


Right on Target

Pointing-and-scanning laser beam technology developed to help NASA space vehicles rendezvous and dock with satellites has led to laser eye surgery advancements. The FDA approved LADARVision® 4000 system employs an eye-tracking device that offers surgeons greater accuracy in reshaping corneas to correct nearsightedness, farsightedness, and astigmatism.

From NASA TO Life

Driving into the Future

Automotive testing and design can be enhanced by Structural Analysis (NASTRAN) program that analyzes and predicts how car parts, systems, and body components will perform (even before prototypes are built).

A NASA-developed anti fog coating that has kept spacecraft windows clear before launch is also being used to prevent fog from forming on car windows.

The automobile industry took a gas-leak detection system originally devised for the Space Shuttle's hydrogen propulsion system and incorporated the technology into the development and production of natural-gas-powered cars.

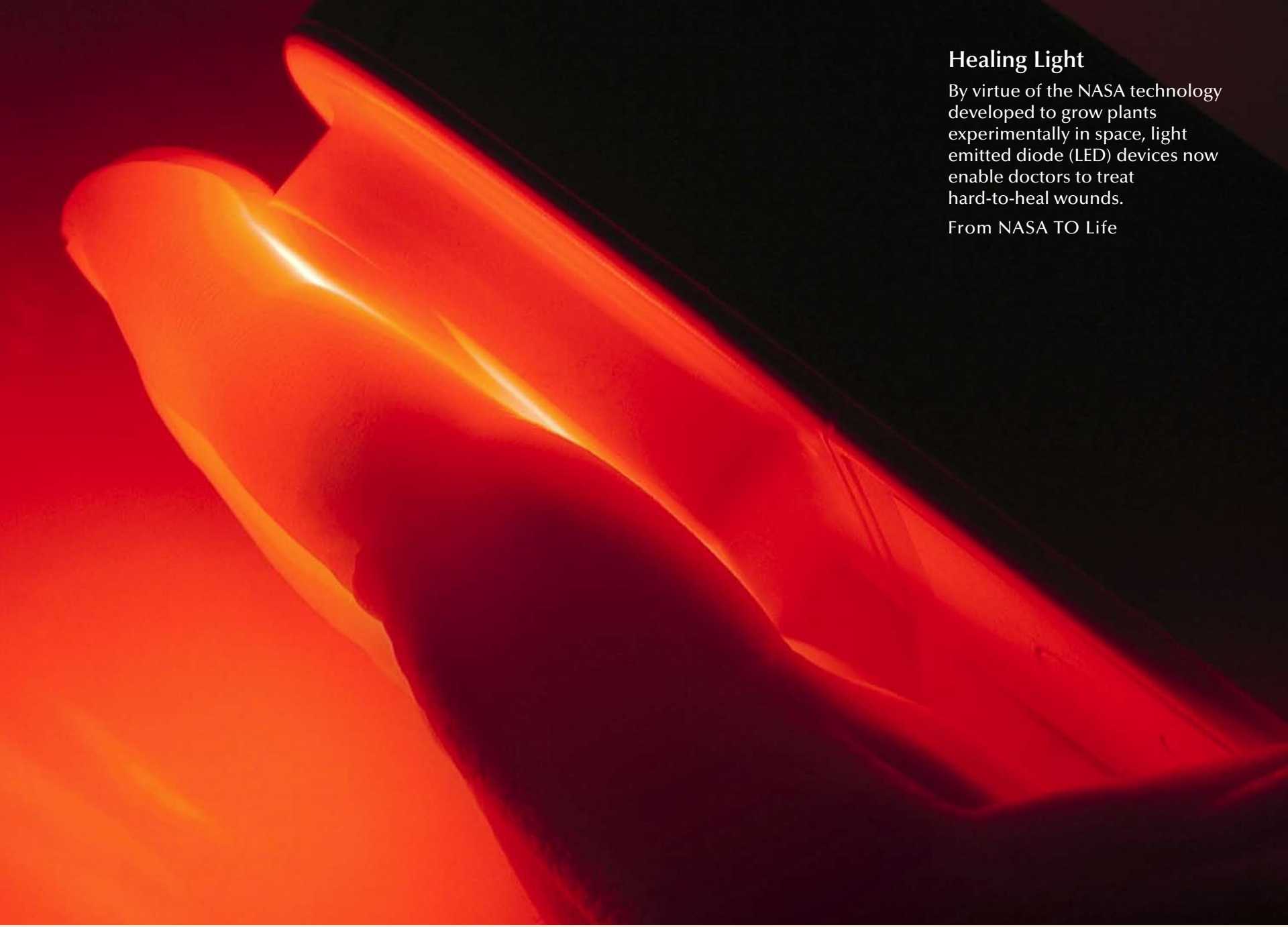
With assistance from NASA, the self-contained SmartPlugTM catalytic ignition system was created as a safer, cleaner, and more efficient method of igniting fuel in combustion engines than conventional spark plugs.

NASA software has stimulated quality improvements and faster development of cores and molds to produce automotive parts.

Initially developed to aid rocket engine nozzle design, a series of NASA computer programs also can effectively analyze and address automotive brake drum problems, thus leading to safer and more durable brake drum design.

NASA's Micromechanics Analysis Code (MAC) technology allows scientists to perform a one-step structural analysis of composite laminates in an effort to design safer and stronger tires.

Various exhaust-measuring devices developed with the aid of NASA technology for applications from aircraft engines to space missions can double as exhaust-measuring tools for cars.



Healing Light

By virtue of the NASA technology developed to grow plants experimentally in space, light emitted diode (LED) devices now enable doctors to treat hard-to-heal wounds.

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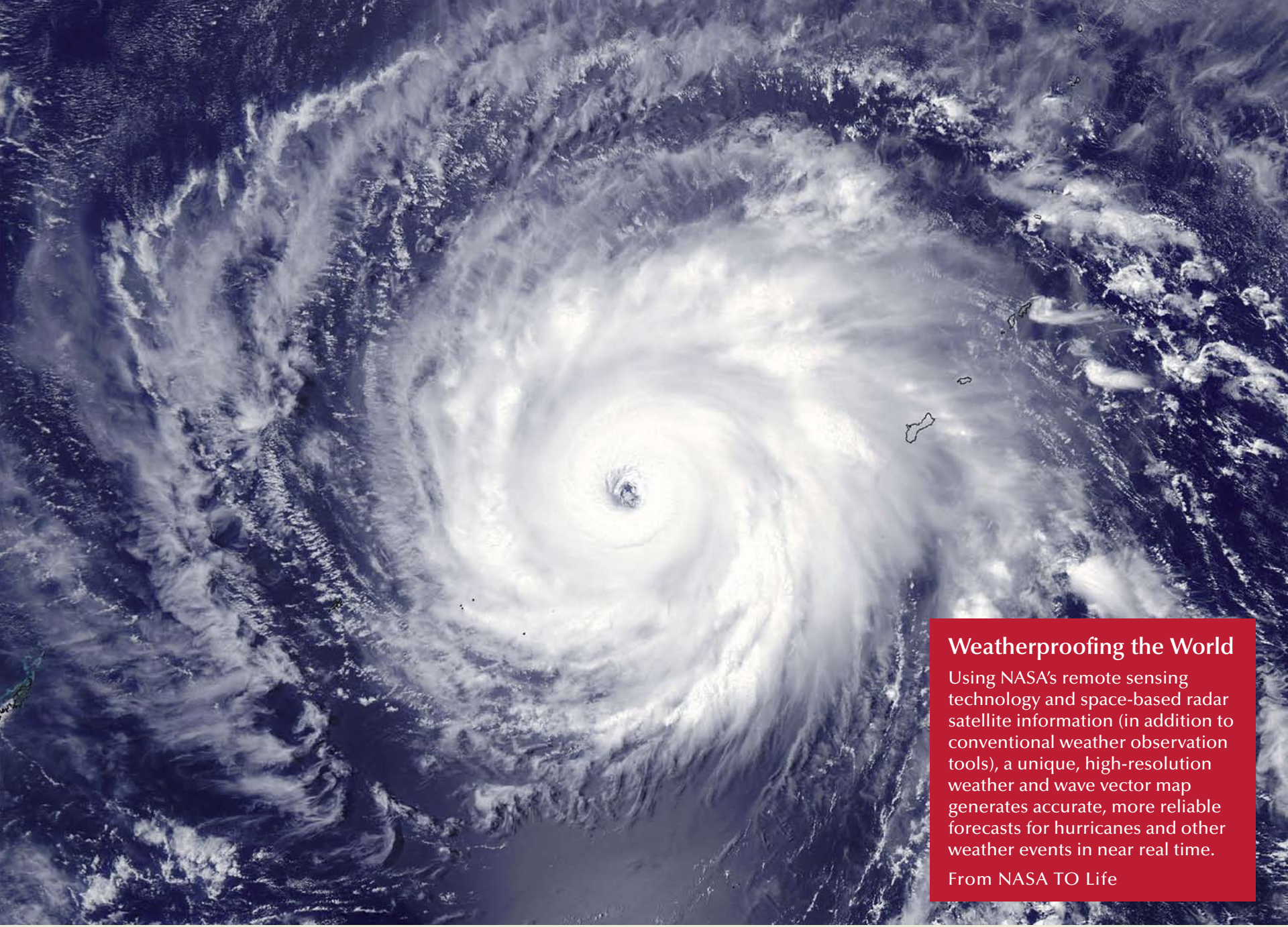

Weatherproofing the World

Using NASA's remote sensing technology and space-based radar satellite information (in addition to conventional weather observation tools), a unique, high-resolution weather and wave vector map generates accurate, more reliable forecasts for hurricanes and other weather events in near real time.

From NASA TO Life

What's Cropping Up?

NASA's efforts to grow plants in space contribute directly to techniques that can increase crop yields here on Earth. For example, by propagating minitubers (potato seeds) in special high-efficiency, pathogen-free growth chambers with temperature, humidity, and light controls, farmers can greatly accelerate the cultivation of potatoes.

From NASA TO Life

Cures in the Making

Thanks to a cell culture apparatus invented at NASA for medical research applications aboard the Space Shuttle, scientists now have the ability to create fragile, three-dimensional cell cultures that can aid the study and treatment of diseases like cancer or Parkinson's. As the central chamber rotates and minimizes the effects of gravity, tissue samples grow in a manner similar to the way tissue develops naturally in the human body.

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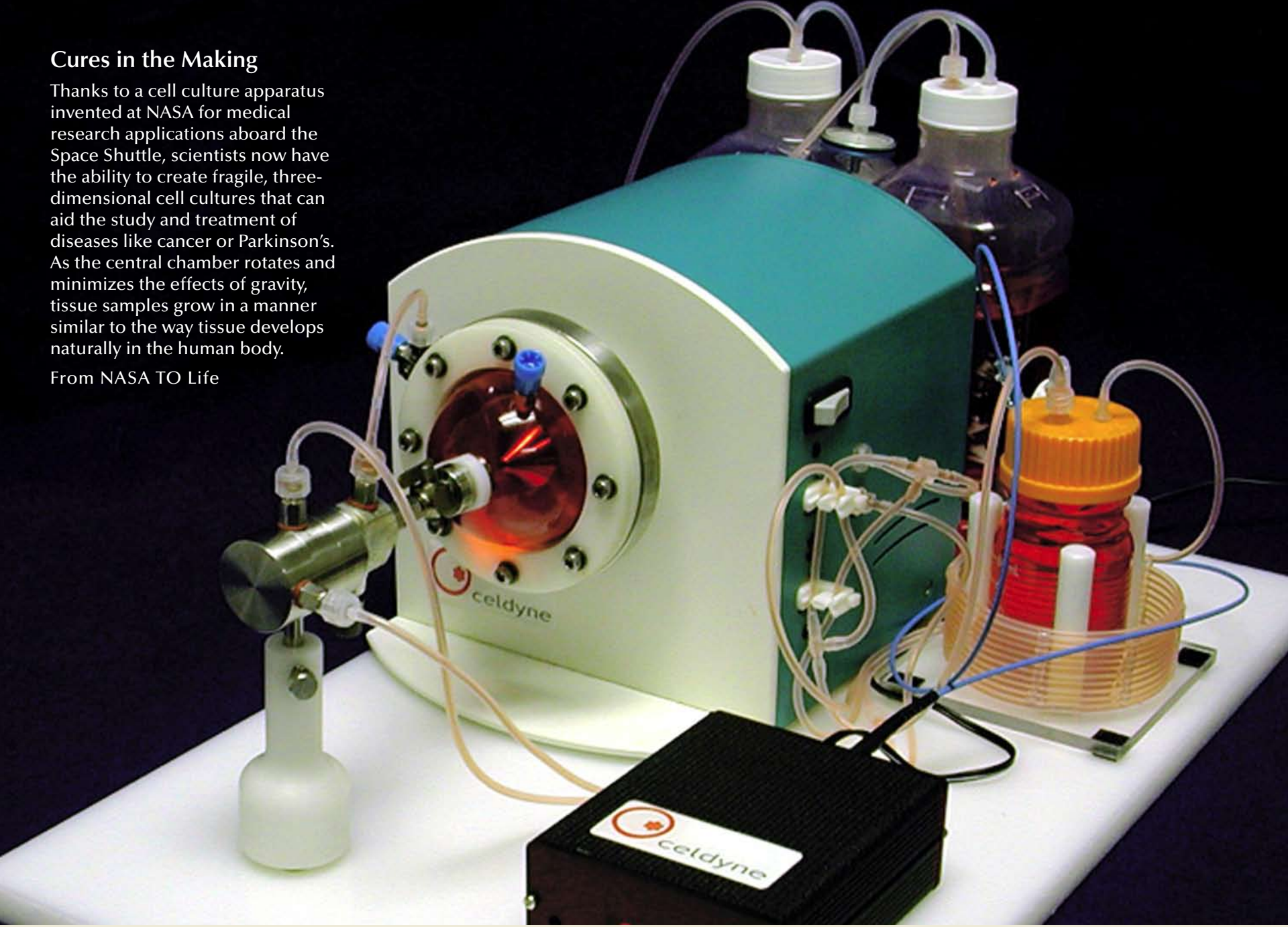

Picture Perfect

Video Image Stabilization and Registration (VISAR) technology, originally invented by NASA scientists to study the Sun and Earth's, weather systems, is providing to be a valuable tool in law enforcement and other security applications. VISAR-based commercial products can stabilize and enhance video images, brighten dark pictures, and enlarge portions of pictures to reveal previously hidden details without altering the underlying footage.

From NASA TO Life

Counteracting Counterfeits

A hyperspectral image sensor originally created to support human exploration and development in space can now analyze images and inks on paper to help identify counterfeit money, passports, and documents.

From NASA TO Life

High-flying Innovations

NASA expertise has provided the technological foundation for reduction in both internal and external aircraft noise, making life quieter for both airline passengers and people on the ground.

Several NASA technological advancements served to support the development of turbofans that have lowered aircraft fuel consumption, noise level, and emissions.

Fuel-efficient and range-enhancing light aerospace composites have also been applied to civil aviation.

NASA wind tunnels have tested commercial airplane designs to confirm wing/airframe integration and structural integrity.

Insulation created to protect areas of the Space Shuttle was the forerunner of blanket insulation designed to shield sections of airplanes from extreme temperatures and fire.

Through NASA research, commercial airliners have access to Global Positioning System (GPS) satellite data that enable precise navigation for air traffic control.

A NASA-developed high-speed digital audio processing system, when combined with a personal computer, delivers three-dimensional sound to air traffic controllers and airline pilots via headphones.

Sweet Smell of Success

Miniature rose plants taken aboard the Space Shuttle have produced a fragrance unlike any Earth-bound rose. The essential oil from this space rose serves as a scent in perfume.

From NASA TO Life

Material Magic

Microencapsulated phase-change materials used to insulate NASA space gloves are now being used in thermal clothing and footwear to protect people from excessive heat and cold here on Earth..

From NASA TO Life

Never Lost

NASA satellite technology, coupled with NASA funding, has stimulated the development of Global Positioning System (GPS) units for a variety of consumer applications, including the Personal Locator Beacon (Micro PLB) transmitter carried by skiers, hikers, and others to help search-and-rescue personnel determine their location in case of emergency.

From NASA TO Life

Clean Air Action

As a natural extension of the ethylene-scrubber system utilized in plant-growth experiments aboard the Space Shuttle, the AiroCide TiO2 air purifier uses ultraviolet light and ethylene-gas removal technology to destroy 98 percent of irritants like dust mites (shown here), molds, and fungi and to kill 93.3 percent of airborne pathogens like *Bacillus anthraci* (anthrax).

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Cushy Comfort

The special NASA foam invented to improve seat cushioning and impact protection in aircraft has been transformed into mattress pads, pillows, and other items designed to provide padding and protection.

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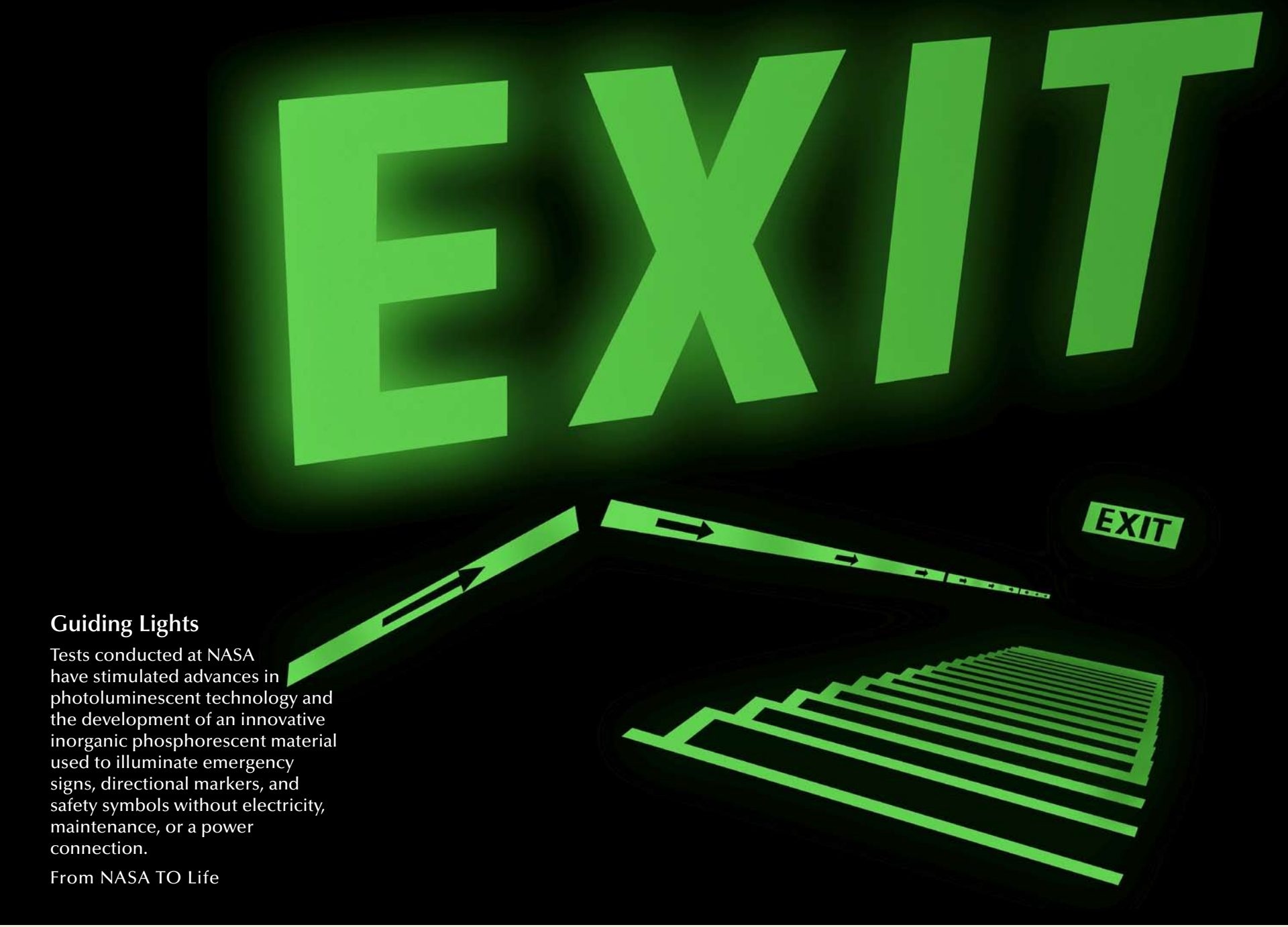

Guiding Lights

Tests conducted at NASA have stimulated advances in photoluminescent technology and the development of an innovative inorganic phosphorescent material used to illuminate emergency signs, directional markers, and safety symbols without electricity, maintenance, or a power connection.

From NASA TO Life

Temperature by Touch

Devices like this infrared thermometer (which scans arterial blood through the skin's surface) have arisen from super-thin infrared temperature sensors created for a research project in which NASA was a partner.

From NASA TO Life

Cordless Dream Machines

Portable drills wielded by astronauts on the Moon played a role in the early development of rechargeable cordless drills, screwdrivers, and other household tools.

From NASA TO Life

Cool Shades

Sunglasses originally designed for NASA astronauts have been adapted for consumer use. The specially coated, scratch-resistant lenses protect eyes against harmful infrared and shortwave blue light, and the titanium-alloy frames are comfortably lightweight and prevent allergic reactions.

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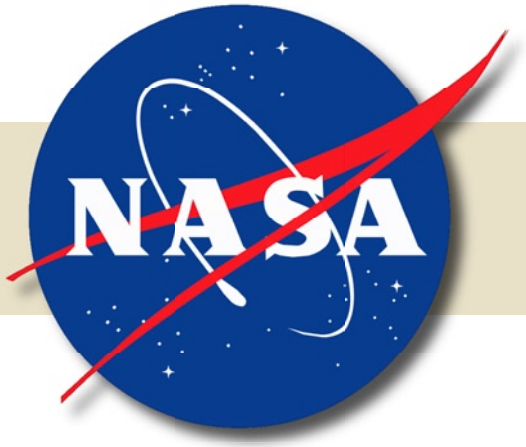

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