Information and Communication Technologies
Softica automatic doors light up

A system that injects light into glass was modified for automatic doors. The doors can now be customized, offering an extremely affordable medium for visual communication.

Exploring in-memory computing

The ERC-backed My Cube project is setting its sights on the first-ever in-memory computing technology. The goal is to be able to carry out simple computations directly in a circuit’s memory.

Micro-coolers developed in Grenoble equip main ring at CERN

Leti, a CEA Tech institute, was selected to supply micro-coolers for CERN’s LHCb experiment, one of four conducted on the synchrotron’s main ring. Leti had previously contributed to the NA62 experiment at CERN.

The “smart eye” for construction sites goes public

Arcure, founded in 2009, develops 3D vision systems for industrial and construction vehicles with the support of List, a CEA Tech institute. The company recently completed its initial public offering. We spoke to List artificial intelligence, language, and vision expert Patrick Sayd, who develops the image-analysis-based pedestrian-detection technology Arcure uses in its products.
Taking gas chromatography out of the lab

Primosens is a miniaturized and portable gas chromatography system developed under a French government CBRN-E counterterrorism program. It can detect the presence of a given gas in a mixture right at the testing site. The advance also offers potential for use in fields other than counterterrorism.

Scintil Photonics enables better-performing and more cost-effective optical communications

Startup Scintil Photonics, a spinoff of Leti, a CEA Tech institute, is developing optical communications technologies capable of achieving speeds of 800 Gbit/s at a very competitive cost. The company won the Bpifrance i-lab award in 2018. CEO Sylvie Menezo told us more.

Accelerometer performance gets another boost

A MEMS-type accelerometer capable of measuring acceleration in three directions with a larger field of detection and greater sensitivity than conventional sensors was developed at Leti, a CEA Tech institute.

World first: Miniaturized solid-electrolyte microbatteries

The world's first solid-electrolyte lithium-ion microbatteries have been developed to meet the needs of specific healthcare applications.
Artificial intelligence successfully implemented in low-power demonstrator

SamurAI is the first-ever demonstrator system to bring together two previously-incompatible worlds: artificial intelligence and low-power communicating devices.

Cell cultures come into the light

For the first time ever, Leti, a CEA Tech institute, demonstrated the non-toxicity of its OLED chips on bacteria in culture. The experiments also revealed that the devices are not subject to degradation in biological conditions.

Waste sorting: Terradona’s Cliiink reinvents deposit schemes

Terradona sells a connected deposit-inspired solution for recycling drop-off containers that is gradually gaining traction. When equipped with the company’s smart panel, containers can actually encourage users to sort better.

Printed electronics: Transistors scaled up to system-level prototypes

The first-ever proof-of-concept prototypes that enable the creation of printed subsystems were recently completed using a second-generation transistor technology. This advance will pave the way toward the development of demonstrators with optimized electronic integration for specific applications.
Leti continues to expand its 300 mm capabilities with new equipment

Several pieces of new equipment have been installed on the 300 mm line in the cleanroom at Leti, a CEA Tech institute. The new equipment will position Leti to offer semiconductor companies an even broader range of services to meet their needs.

Real-time indoor tracking of cordless industrial power tools

Industrial tool manufacturer Desoutter turned to the CEA Tech Pays le Loire regional technology transfer platform in Nantes for help developing a powerful, easy-to-use solution to locate industrial tools in real time inside buildings.

P-link: Could the future of copper be plastic?

The P-link peripheral-to-peripheral high-speed data transfer system is cheap, robust, efficient, and low-power, making it the perfect candidate to replace copper or fiber optic cable in some applications.

Retina technology revolutionizes the world of imagers

Leti, a CEA Tech institute, recently unveiled its first-ever smart imager made with a 3D stack. The result of seven years of R&D, the Retina imager’s tightly integrated processor and sensor are capable of analyzing images in record time.
Artificial intelligence looks to living organisms for inspiration

A new chip inspired by biological neural networks combines—for the first time ever in the same circuit—analog pulse-coded neurons and resistive OxRAM synapses.
Technologies for healthcare
CEA-Leti Breakthrough Opens Path to New Vaccine for HIV Using Lipid-Nanoparticle-Delivery Technology

Lipidots Platform Strengthens Immune Response to Protein That Is Key to HIV Vaccine; Results Presented in Nature Publishing Group’s npj Vaccines

Published on 27 February 2019

Leti’s lensless microscope was adapted to enable 3D image acquisition

The three-dimensional cell culture images obtained will be used by biologists to study cell self-organization.

Published on 2 April 2019

Medical scans: reducing doses without compromising on diagnostic quality

List, a CEA Tech institute, developed a mathematical model to improve medical imaging protocols so that the lowest possible dose of ionizing radiation can be used without negatively affecting the reliability of the diagnosis.

Published on 23 May 2019

Automated biological sample preparation with PEP’s

The PEP’s automated biological sample preparation kit has been released. The result of three years of research and development backed by the people at Y.SPOT and financed by the Carnot Network, the kit won an “Innovation Best Team Practices” award in the Products and Services category from the Paris Innovation Directors’ Club on September 5, 2019.

Published on 10 September 2019
Better control of patient exposure to radiation during cardiac catheterization

Reference beams used to measure the doses delivered by X-ray imaging equipment used in interventional cardiology have been developed by France’s national radiation testing and metrology lab, LNHB.

Acoustic waves manipulate microscopic objects contact-free

Researchers at Leti, a CEA Tech institute, came up with a novel way to manipulate microscopic objects: evanescent acoustic waves. Their findings were published in Nature Communications Physics and the technique could have a bright future in biotechnology.
Renewable energy and energy efficiency
Investigating the impact of hydrogen pollutants on fuel cells

A study of the impacts of various pollutants present in hydrogen on fuel cell performance and lifespans was completed, and the results will aid in the development of international standards.

Better mechanical dimensioning of dual-media thermocline thermal energy storage systems

The first-ever tool to study the pressure exerted by granular material on the walls of the tank containing the material was developed by Liten. The tool will be used to dimension and make improvements to dual-media thermocline-type thermal energy storage systems.

Wind-farm energy management system rolled out in Guadeloupe

The French National Solar Energy Institute (INES) developed and tested an energy management system coupled with battery-based energy storage. The solution is currently being rolled out at the Sainte Rose wind farm in Guadeloupe.

Photovoltaics: Could the thickness of silicon wafers affect their mechanical resistance?

Reducing the thickness of the silicon wafers used to manufacture photovoltaic cells is one of the solutions researchers are investigating to lower production costs—but only if it doesn’t weaken the wafers.
Renewable energy and energy efficiency

Energy Observer wins Mission Innovation Champions award

Energy Observer, the world’s first hydrogen-powered boat, features an innovative end-to-end energy architecture that is 100% carbon-free, distributed, and digital. Didier Bouix, who heads the project at Liten, a CEA Tech institute, recently won the Mission Innovation Champions award for his work.

Diesel fuel produced from microalgae-based biocrude

For the first time ever, diesel fuel has been produced by refining the oil contained in biocrude made using hydrothermal liquefaction of microalgae. The first-ever drops of diesel to be obtained in this way prove that this method for producing biofuel is technically feasible—a major step forward.

Nature-inspired solutions for reducing urban heat islands

A new project at the Ideas Laboratory, an open and collaborative innovation lab, is looking to nature to improve the summertime comfort of people living in Grenoble, France—all while limiting water and energy consumption.

NeoLED facilitates the integration of LEDs into existing electrical wiring systems

The NeoLED LED lighting system can be plugged directly into existing home electrical outlets with no need for an adapter. The patented system is compact and cost-effective to manufacture. It was showcased at the Vivatech trade show in May.
Perovskite solar cells have a bright future in space

Solar photovoltaic cells made using perovskite material are naturally resistant to electronic radiation, making them a potentially-attractive alternative to the multi-junction cells used in space applications.

Enhanced characterization of battery aging

Differential voltage measurement was used to develop models that will enable more detailed characterization of lithium-ion battery aging.

Abuse testing platform gives batteries an extreme workover

A battery abuse-testing platform recently set up in cooperation with Serma Technologies will put batteries to the test in extreme conditions in order to assess their behavior. The platform, housed in a dedicated building, recently completed its first tests on battery modules.

Formation of metal lithium in Li-ion elements observed in real time

A characterization method using nuclear magnetic resonance (NMR) spectroscopy was developed to observe the formation of metal lithium in the electrodes of lithium-ion elements during operation. The insights gained will be used to extend electrode lifespans.
New test bench for high-power fuel cells

A test bench for high-power PEMFCs is now up and running at Liten, a CEA Tech institute. The test bench can characterize stacks up to 100 kW.

Preventive monitoring of solar PV power plant losses

Liten, a CEA Tech institute, is currently developing software to pinpoint losses in solar PV power plants. The software should be helpful in improving plant maintenance to ensure optimal performance.

Heterojunction solar cells could soon be ready for manufacturing

Industrial-sized batches of silicon heterojunction solar cells with yields of 24% were recently manufactured at high throughput. Some cells set a yield record of 24.25%. The test runs mark a new step forward toward readying this promising technology for manufacturing.
Materials and processes
Improving lithium-ion battery recycling

New insights into the mechanisms that underpin the dissolution of the components used in lithium-ion batteries have resulted in the development of an improved recycling method.

Brake-pad nanoparticle emissions under the microscope

Automotive equipment manufacturers recently took advantage of CEA Tech institute Liten’s testing know-how to study the nanoparticle emissions of different types of brake pads.

World-first presented at ECTC

A silicon component cabled using wire bonding and encapsulated with a polymer using 3D printing was presented at ECTC 2018 in San Diego.

Hydrogen’s influence on materials

Researchers investigated whether or not additive manufacturing affects a material’s hydrogen resistance. They designed an experiment to test the theory on parts made from Inconel, a material used for certain parts in the Ariane 6 launcher’s engines.
Smart digital systems
Design improvements boost heat-exchanger performance

Parametric design optimization can improve heat-exchanger performance. A tool suitable for use in industrial environments was developed to address the multi-scale and multi-physics aspects of heat-exchanger design.

SAMBA helps mainstream hearing-impaired students

A solution to help mainstream hearing-impaired students has been implemented in research conducted under the Y.SPOT project to promote collaborative innovation to respond to the major challenges facing our society today and in the future.

Automating toxic chemical identification

List, a CEA Tech institute, partnered with the French National Center for Scientific Research (CNRS) to develop an algorithm to automatically identify toxic chemicals and explosives in real time. The research was part of a French government CBRN-E 1 counterterrorism program.

Electromagnetism used to study the mechanical properties of steel

Researchers at List, a CEA Tech institute, have developed simulation models and tools that leverage electromagnetism to characterize steel. These models and tools will be integrated into the CIVA platform so that they can be used to develop industrial non-destructive testing processes.
Listening to the flows inside pipes to monitor structural health

A passive non-destructive testing (NDT) method was developed for the inspection of pipes. The sound of the flows inside of the pipes is processed by a purpose-developed tomography algorithm that reconstructs the pipes' thickness profile.

Augmented non-destructive testing for greater reliability

Manual non-destructive testing (NDT) is widely used in industry, and relies heavily on procedures and on the operator’s skill level. Real-time monitoring and augmented reality tools were recently developed to assist operators with their NDT tasks.

Real-time 3D image reconstruction for non-destructive testing

A new image reconstruction algorithm that is 30 times faster than the prior state of the art has placed real-time inspection within reach. The algorithm, based on techniques used in medical imaging, was utilized for non-destructive testing (NDT), where it produced 3D images in real time.

Complex computations on encrypted data now possible

In e-healthcare, keeping personal data confidential is crucial. But when you store and analyze data on servers that are connected to the internet, that data becomes vulnerable to hackers, especially during transmission. A brand new homomorphic encryption system has made complex computations on encrypted data possible.
ExpressIF platform now offers constraint satisfaction reasoning capabilities

Solving combinatorial problems requires special artificial intelligence software. This type of software was recently added to the ExpressIF platform, which can now solve even more complex problems.

Keeping vehicles on course at all times

FlexFusion is a new software application that can combine data from different sensors to pinpoint a vehicle’s position at all times, even if GPS data is no longer available due to tampering or satellite signal issues.

New human-machine interfaces make driving tractors easier

A haptic interface was developed by researchers at List, a CEA Tech institute, to make operating farm machinery easier. An initial prototype centralizes the control of two major functions: the gearbox and draft.

Tendermint blockchain consensus under the microscope

The Tendermint blockchain consensus was recently validated—a noteworthy occurrence in the world of blockchain, where proof of the validity of protocols is only rarely provided.
Y.SPOT explores structural electronics

One of the missions of the Y.SPOT collaborative innovation platform is to encourage the CEA Tech institutes to work together through cross-disciplinary projects. Structural electronics is the focus of one of the first projects of this kind to be run under the Y.SPOT initiative.

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Y.SPOT

Published on 7 October 2019

**Y.SPOT at Sport Unlimitech trade show kickoff edition**

Grenoble Open Innovation Center Y.SPOT was front and center at the inaugural edition of the Sport Unlimitech trade show held at Lyon’s Gerland Stadium from September 19 to 21. Several prototypes and demonstrator systems that illustrate the kinds of innovative sports-related products and services developed at this open, collaborative innovation hub were showcased at the event.

Published on 18 November 2019

**Agro-food industry in the spotlight at CEA Tech workshop**

CEA Tech’s research institutes develop technologies that can improve process control in the agro-food industry. A workshop held on September 18 at the CEA Grenoble campus provided expert insights into how.
And also...
Two CEA Tech demonstrators in Novares’ Nova Car 2

Novares unveiled its Nova Car 2 demo car to manufacturers on June 25. The car incorporates around fifteen patented innovations, two of which were developed by CEA Tech institutes.

CERN “Code of the Universe” exhibit comes to Grenoble

CERN’s travelling photographic exhibit, «The Code of the Universe,» is in Grenoble from September 16 to November 18, 2019. Visitors can immerse themselves in this journey of discovery free of charge on the MINATEC micro and nanotechnology innovation campus.

Auvergne Rhône-Alpes regional government supports innovation

The Auvergne Rhône-Alpes (AURA) regional government is supporting economic development and job creation through a partnership with the CEA signed in 2018. The partnership has financed some major equipment purchases.