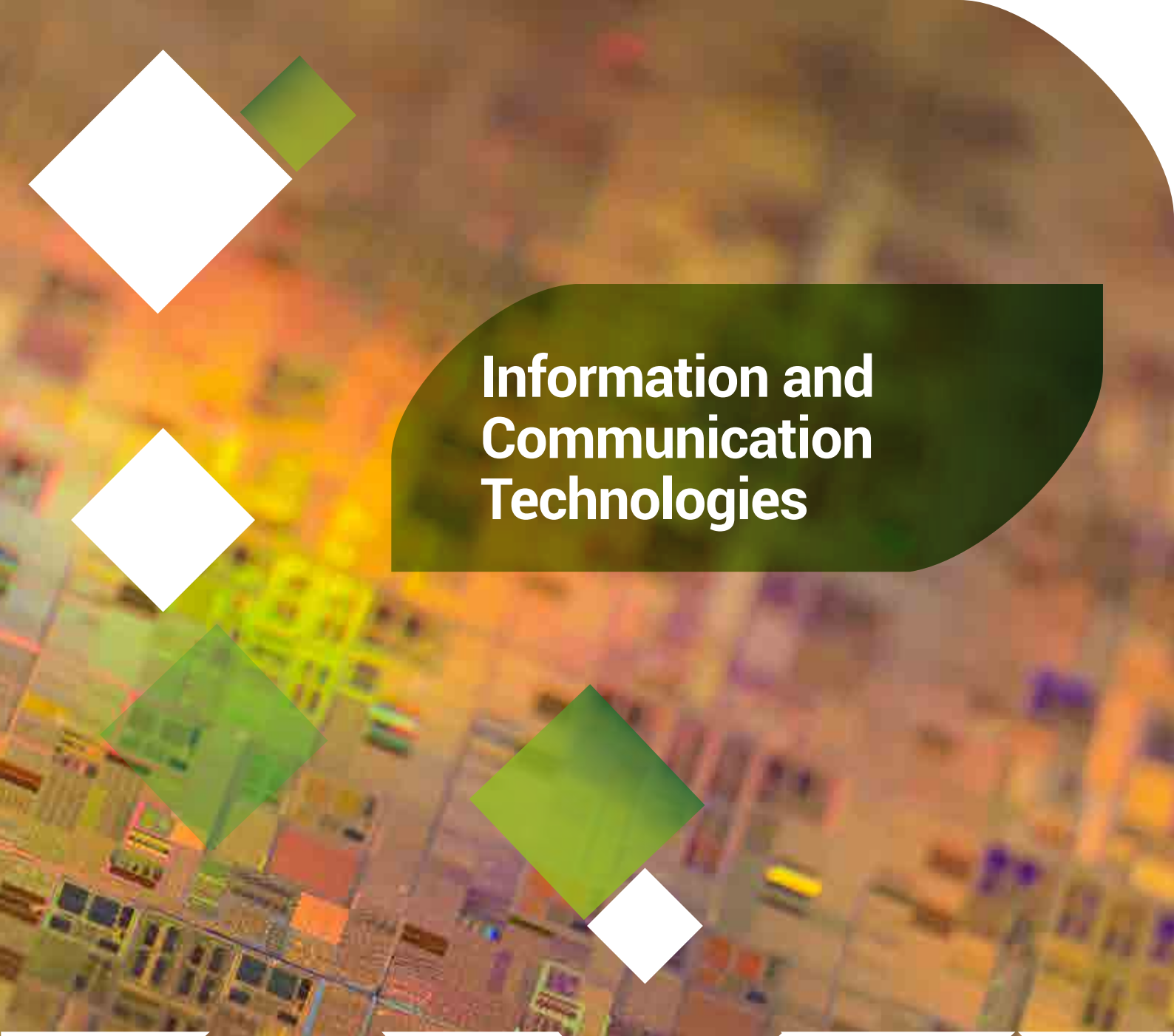
FROM RESEARCH TO INDUSTRY

cea tech

# PRESS REVIEW 2018



# Information and Communication Technologies

Published on 16 January 2018

## Fingerprints under the microscope

A new fingerprint analysis technology based on piezoelectric nanowires was developed in research conducted under the EU PiezoMAT project. The advance will pave the way for the development of sensors with resolutions in excess of 500 dpi.

Published on 29 January 2018

## More efficient Wi-Fi for Falcon jets

Falcon jet manufacturer Dassault Aviation turned to Leti, a CEA Tech institute, to set up a test bench capable of realistically emulating the radiofrequency wave propagation channel for different Falcon jet cabin configurations.

Published on 1 February 2018

## Research offers hope of new treatment for blindness

The degeneration of retinal ganglion cells, a type of neuron, is one of the main causes of blindness in the Western world. Researchers are exploring how optogenetics and electronics can be combined to compensate for malfunctioning retinal ganglion cells and restore a form of vision.

Published on 20 February 2018

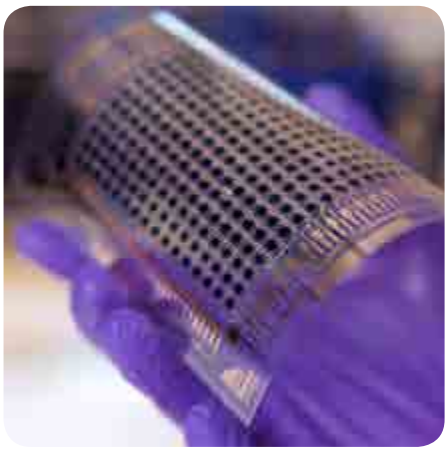
## Shorter time-to-market for CPS-based solutions

The EU-backed FED4SAE project, coordinated by Leti, a CEA Tech institute, recently kicked off. The goal? To shorten time-to-market in Europe for solutions leveraging cyber-physical systems (CPS).

Published on 26 March 2018

## Pixcurve reduces camera size by half

A curved sensor that limits the number of lenses required in optical equipment was recently developed. The new sensor reduces the volume of camera modules by half, creating opportunities for the manufacturers of cameras, smartphones, and other optical systems.



Published on 3 April 2018

## Printed electronics: first-ever active matrix

For the first time ever, a 256-pixel active matrix was printed at the PICTIC platform at Liten, a CEA Tech institute. This is the first-ever system-level demonstrator and it confirms the potential of printed electronics for industrial-scale manufacturing to equip tomorrow's high-tech devices.

Published on 17 May 2018

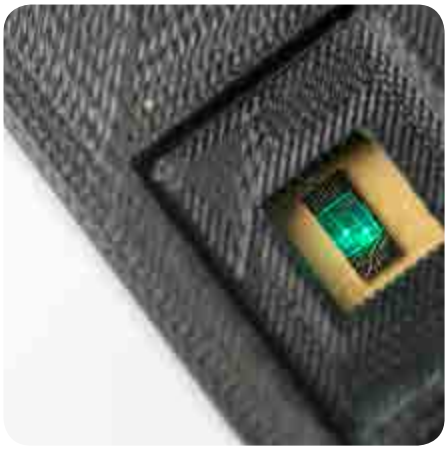
## Nanopix, the world's smallest gamma camera

The world's smallest gamma camera was developed to enable Orano to map hot cells at its nuclear fuel reprocessing plant in La Hague, France.

Published on 19 June 2018

## Analyze more, consume less energy

Compressed data acquisition collects and analyzes only the useful part of a signal—the part that contains the most relevant information. A system to test the compressed acquisition of radiofrequency signals was set up in lab conditions.



Published on 26 June 2018

## A decade of research on microdisplays

A review of a decade of research on GaN microdisplays authored by a researcher at CEA Tech institute Leti and published in the Journal of the Society for Information Display recently won a Best Paper award.

Published on 2 July 2018

## Avalanche photodiodes bring new capabilities to space communications

Mynaric Lasercom is banking on infrared avalanche photodiodes developed by Leti to increase the speed and performance of optical communications for space applications.

Published on 21 August 2018

## More secure data on mobile platforms

The EU Mobitrust project helped to develop more secure environments for the execution of critical applications on new mobile platforms.

Published on 23 August 2018

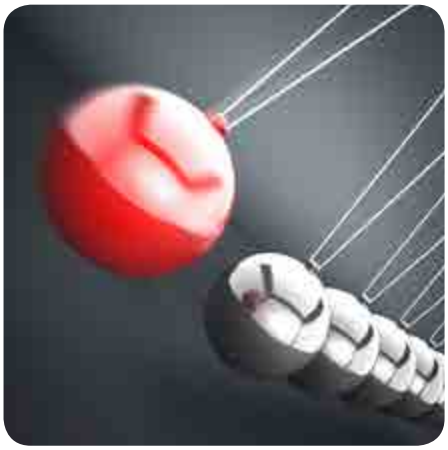
## Plastronics processes gain in maturity

A capacitive plastic part prototype that meets the automotive industry's requirements was recently developed in partnership with SE2D (Symbiose Engineering Design Development).

Published on 28 August 2018

## Microfluidics: standards to promote R&D

Leti, a CEA Tech institute, is coordinating the development of ISO standards for microfluidics. The goal is to speed up research and development in a field where design rules are often proprietary and empirical.



Published on 6 September 2018

## Harvesting energy from sporadic impacts

Leti, a CEA Tech institute, and STMicroelectronics have developed a circuit that can harvest the mechanical energy produced by sporadic impacts in vibratory environments and enable self-powered devices.

Published on 13 September 2018

## Evaluating perception sensors for autonomous vehicles

Transdev, a company that specializes in transportation technology, has kicked off a program to characterize and evaluate LiDAR sensors. The testing campaign will lead to improvements in autonomous vehicle performance and safety.


Published on 8 October 2018

## World-class SOI prototyping line

Soitec, one of the seven leads of the Nano 2022 plan, and Leti, a CEA Tech institute, recently renewed and expanded their innovative substrate R&D partnership.

Published on 16 October 2018

## Shaping the vehicle of the future

Tomorrow's land transportation will be clean, smart, and shared. CEA Tech has been driving advances in the vehicle of the future through targeted research programs for years.

Published on 16 October 2018

## Uncooled infrared detectors for safer autonomous vehicles

Microbolometers, which are infrared detectors that operate at ambient temperature, were first developed for military and space applications. Today, the devices are making their way into driverless cars, where they are helping improve safety.

Published on 12 November 2018

## High-performance, low-cost mid-infrared detectors for industry

EU Horizon 2020 project REDFINCH is tackling the next generation of miniaturized portable optical sensors to detect gases and proteins in liquid. The sensors under development will initially target the petrochemical and dairy industries.

Published on 19 November 2018

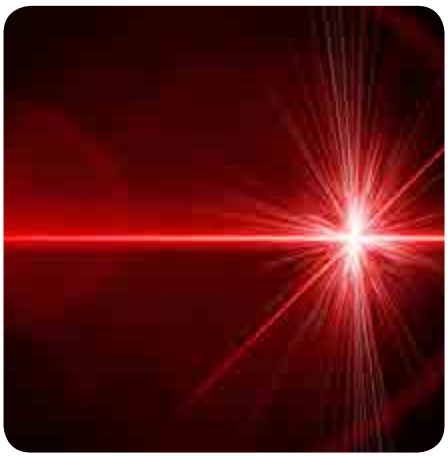
## Energy harvesting devices equip water distribution network to power communicating sensors

A micro-hydro turbine designed to be integrated into water distribution networks was developed at Leti, a CEA Tech institute. The turbine harvests energy from the flow of water to power sensors used to monitor the network.

Published on 22 November 2018

## EVOC multi-mode nuclear physics training platform

The INSTN* EVOC training platform has been up and running since October. The platform's innovative virtual-reality training environment makes it like no other facility in the world.



Published on 7 December 2018

## MIRPHAB brings mid-infrared technology to industrial companies

The MIRPHAB pilot line is a one-stop-shop for mid-infrared detection technologies. It is available to companies that would like to integrate state-of-the-art chemical sensors into their products.

# Technologies for healthcare

Published on 8 February 2018

## Connected knee implant in response to increase in osteoarthritis

The FollowKnee project, spearheaded by Brest Hospital, was set up to develop a smart communicating knee implant that can provide information on the implant's mechanical condition and trigger an alert in the event of an infection.

Published on 1 March 2018

## Advances in the calibration of short-life radiopharmaceuticals

LNHB, a laboratory of List, a CEA Tech institute, helped develop a transportable primary calibration instrument for radiopharmaceuticals.

Published on 24 April 2018

## Hospitals could soon welcome robots

CEA Tech's digital companion was selected in a call for projects to invent the solutions that will shape tomorrow's hospitals. The first robots will be developed in conjunction with Nantes University Medical Center.

Published on 31 May 2018

## Measuring racecar noise

Signal analysis methods were used to measure noise during auto races in order to assess environmental impacts and standardize measurement.

Published on 28 June 2018

## Toward more effective dose control in electronic brachytherapy

A dosimetric reference was developed to more effectively control doses administered to breast cancer patients receiving electronic brachytherapy treatment.

Published on 5 July 2018

## Cold could someday be used to treat epilepsy

The Epicool project is investigating the use of optics to cool epileptogenic areas in the brains of epilepsy patients resistant to other treatments. A prototype implantable device is currently being developed and will be miniaturized before animal testing begins.

Published on 24 September 2018

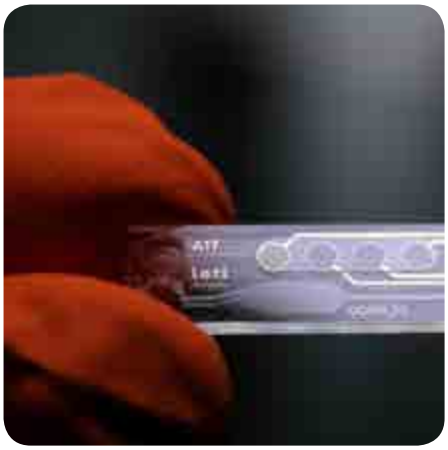
## DOSEO expands training for medical physicists

The DOSEO radiotherapy research and training center recently created a new training course combining theoretical and hands-on learning over three two-day sessions. The new course is being offered in response to high demand from medical physicists.

Published on 11 October 2018

## Biomargin gets biomarkers talking

In research conducted under the Biomargin project, a series of reliable, robust biological signatures were identified to predict the risk of rejection after a kidney transplant. The biomarkers will help doctors make the best possible decisions for their patients.



Published on 25 October 2018

## Home monitoring for heart failure patients

CardioRenal recently partnered with Leti, a CEA Tech institute, to develop a remote monitoring system to keep an eye on heart failure patients in their homes. CardioRenal plans to release the system on the market in 2020.

# Renewable energy and energy efficiency

Published on 22January 2018

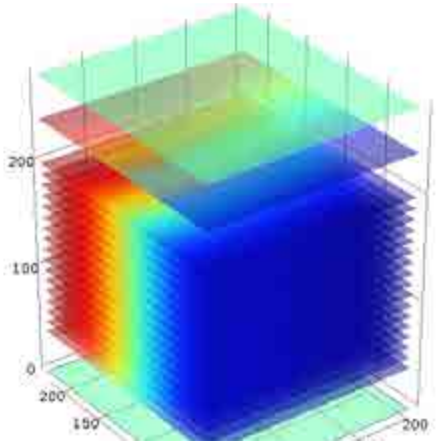
## Chili invests in solar photovoltaic energy

As part of the Atamos-TEC project, CEA Tech institute Liten is working alongside ISC Konstanz and Fraunhofer GH to help establish a solar photovoltaic energy industry in Chile.

Published on 22 February 2018

## Liten presents island microgrid management tools to French energy research alliance

Liten, a CEA Tech institute, presented its digital tools for dimensioning and managing energy storage solutions at the ANCRE press conference on February 7, 2018. Liten's solutions facilitate the integration of renewable energy into island grids.




Published on 8 March 2018

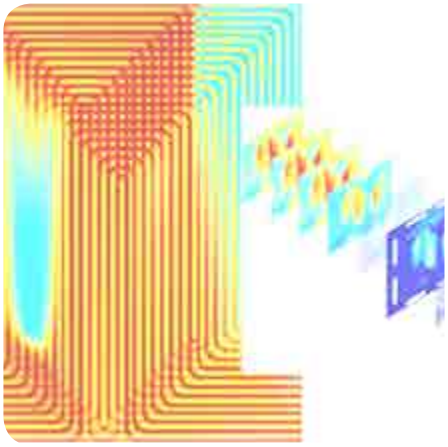
## Electrochemical generator operation characterized at all scales

The MUSES numerical simulation platform is used primarily to study the behavior of fuel cells and lithium-ion batteries at different scales to provide deeper insights into how they work.

Published on 15 March 2018

## Jupiter 1000 up and running !

Construction on the Jupiter 1000 power-to-gas demonstrator plant began on December 19, 2017 in Fos-sur-Mer in the South of France. The groundbreaking ceremony was attended by a number of elected officials. Research scientist Laurent Bedel of Liten, a CEA Tech institute, spoke to us about the project.



Published on 22 March 2018

## PEMFCs: liquid water distribution over large area simulated

Liten, a CEA Tech institute, used the MUSES platform's multi-physics models to generate simulations of the distribution of liquid water on the surface of a PEMFC-type fuel cell.

Published on 10 April 2018

## Pressurized co-electrolysis successfully demonstrated

Pressure can enhance the performance of co-electrolysis without negatively affecting equipment lifespans. Researchers recently demonstrated the principle for the first time ever in a long-duration test.

Published on 15 May 2018

## A new breed of heating network tested in Grenoble, France

Several energy-related advances for the City of Grenoble, France were unveiled to the public as part of the CITY-Zen Days initiative. One of them is an innovative heating network. The prototype is currently under construction and the new network will round out France's second-largest heating network.

Published on 24 May 2018

## Perovskite solar technology scaled up from cell to module

Perovskite-based photovoltaic systems were recently created on larger surfaces than the current laboratory prototypes, enabling the technology to be scaled up from individual cells to modules.

Published on 7 June 2018

## Tunisia's electricity grid gets smart capabilities

The Tunisian government has adopted an energy transition policy that includes multiplying the contribution of renewable energy tenfold within twelve years. To successfully make the transition, the country needed a smart-grid solution tailored to local conditions.

Published on 14 June 2018

## Heating and cooling network emulated on CALORIE platform

A heating-network substation was commissioned in the lab for testing, and then upgraded to a more advanced version. Two testing platforms at solar energy research center INES were connected for the first time ever for the tests.

Published on 10 July 2018

## Hybrid polymer electrolytes make batteries safer

A new hybrid polymer electrolyte technology with the capacity to enhance battery safety was developed for Solvay. The company has begun presenting the new technology to battery manufacturers.

Published on 10 September 2018

## Objective: Hydrogen

The French government recently announced its strategy to develop hydrogen to drive the energy transition. Liten, a CEA Tech institute, plans to leverage its know-how in hydrogen technology and software to support this strategy.

Published on 4 October 2018

## EU COBRA project brings PEMFCs closer to the market

The EU COBRA project was set up to make improvements to PEMFC bipolar plate manufacturing processes and enhance the plates' durability with the ultimate goal of bringing costs down. Several innovations were tested in the lab and on actual vehicles.

Published on 26 November 2018

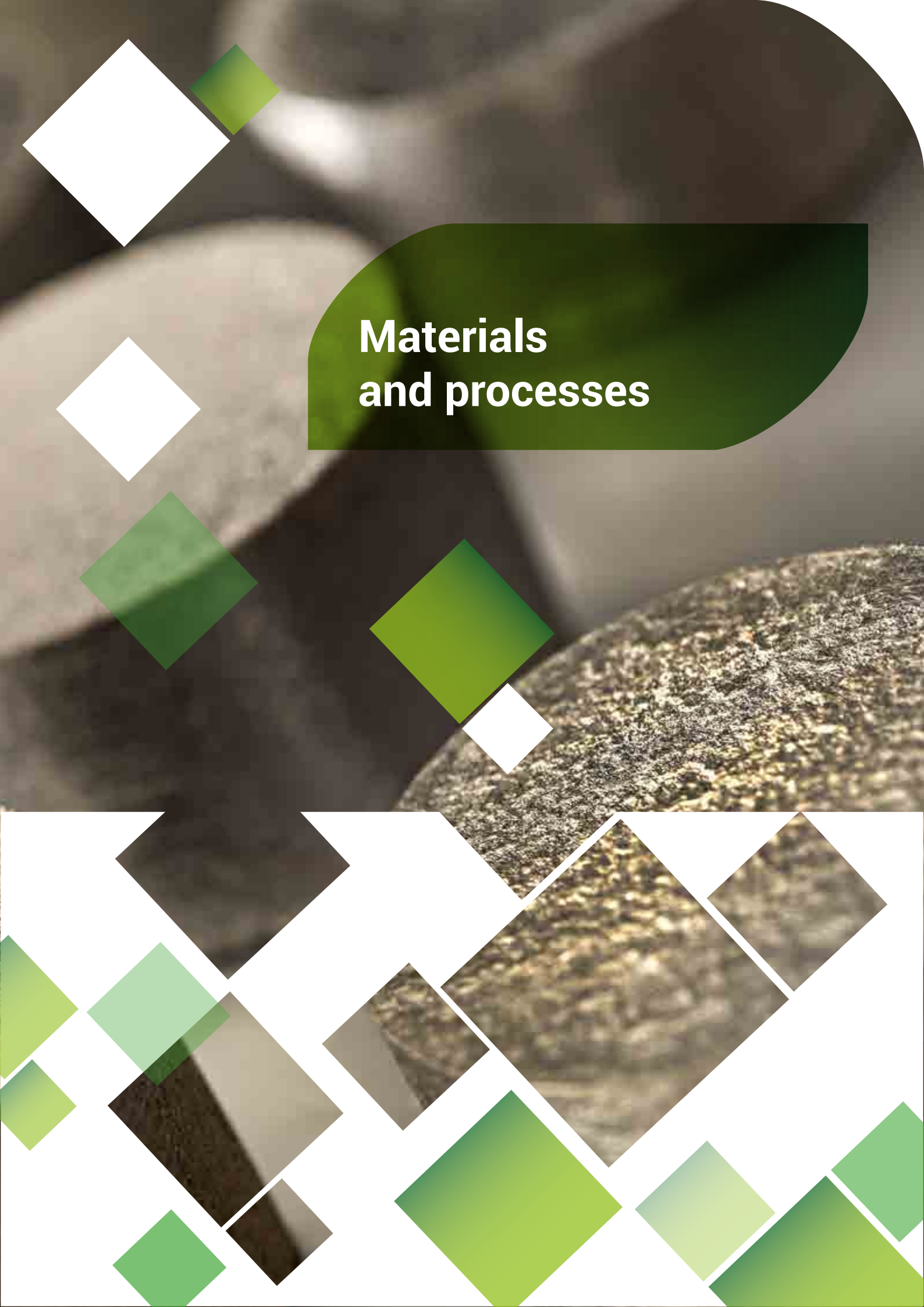
## Photovoltaics: personalized, lightweight modules

Liten, a CEA Tech institute, developed an ultra-lightweight module specifically for the Stratobus project with Thales Alenia Space France (TAS-F), once again demonstrating its capacity to develop personalized modules to meet manufacturers' unique needs.

Published on 18 December 2018

## First power-to-gas demonstrator unit now operational

The first power-to-gas demonstrator unit built on technology developed by the CEA was commissioned a few months ago. The early results are very encouraging for the future of the technology, which could play a major role in facilitating the integration of renewable energy into our grids.

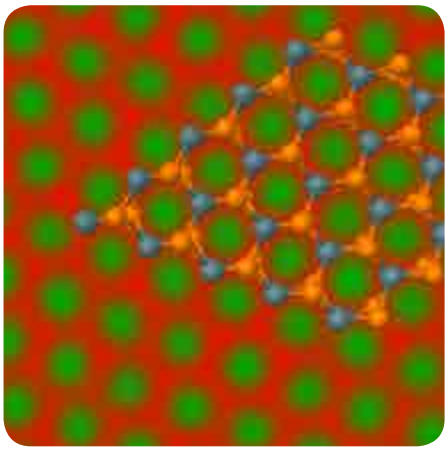


# Materials and processes

Published on 6 February 2018

## New developments in transparent heating polymer films

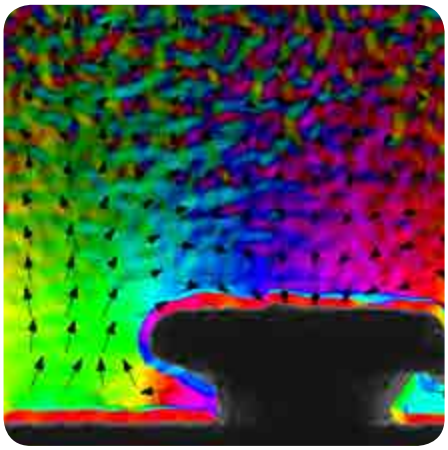
CEA recently patented the world's first 100% polymer film that is both heating and transparent. The new film could be a good candidate to replace existing materials in electrodes and transparent heating films.



Published on 5 March 2018

## Electron holography delivers atomic resolution, providing new insights into material structures

Researchers at Leti, a CEA Tech institute, recently developed an electron holography technique capable of imaging material structures with a spatial resolution of just one atom.



Published on 5 June 2018

## HoloView takes electronic holography to new levels

HoloView software can generate electronic holography images with currently-unrivalled spatial resolution and sensitivity.

Published on 21 June 2018

## Poudr'Innov expands its services for metal materials

Poudr'Innov 2.0, a technology platform operated by Liten, a CEA Tech institute, recently acquired an LBM (laser-beam melting) additive manufacturing machine from Prodways, the leading provider of industrial 3D printing solutions.

Published on 20 September 2018

## Nanomaterials characterization for businesses

Reliable and reproducible nanomaterials characterization protocols have been developed at Liten and are now available to businesses for their nanomaterials testing campaigns.

Published on 5 November 2018

## First-ever PIM power component produced

A power transformer with satisfactory thermal performance was produced using powder injection molding (PIM) and a printed-circuit-type industrial assembly. This advance will pave the way to smaller power supply components suitable for a variety of mobile devices.

# Smart digital systems

25 January 2018

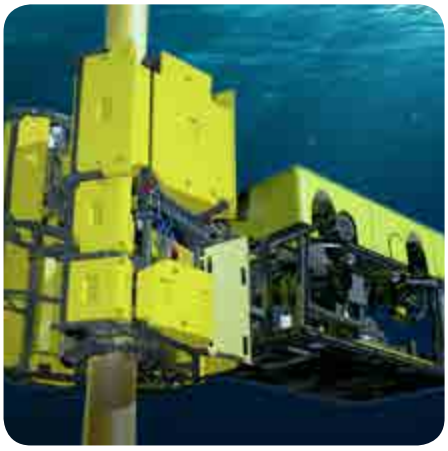
## Touch screens: localized impulses for more accurate haptic feedback

Researchers at List, a CEA Tech institute, used time-reversal wave focusing to generate localized impulses on the surface of touch screens.

Published on 12 March 2018

## Ambient intelligence: MobileMii gets more advanced features

List, a CEA Tech institute, recently unveiled some advanced new features added to its MobileMii Smart Home ambient intelligence platform, which can now recognize activities in addition to actions. These capabilities will create opportunities in smart home automation and in-home monitoring for assisted living applications, for example.



Published on 19 March 2018

## World-first in non-destructive testing of flexible subsea risers

List, a CEA Tech institute, helped to develop a particularly innovative embedded system that combines several non-destructive testing technologies. TechnipFMC, a provider of services to the oil and gas industry, will use the system to inspect flexible subsea risers.

Published on 29 March 2018

## Remote computing just got more secure

List, a CEA Tech Institute, implemented homomorphic encryption technologies that enable «blind»—in other words, totally confidential—computation on data stored on remote servers. Several industrial applications have been developed using the technique.


Published on 5 April 2018

## Plastic Omnium implements model-driven engineering

Automotive equipment manufacturer Plastic Omnium is implementing a model-driven engineering (MDE) method leveraging Papyrus, an MDE environment developed by List, a CEA Tech institute.

Published on 26 April 2018

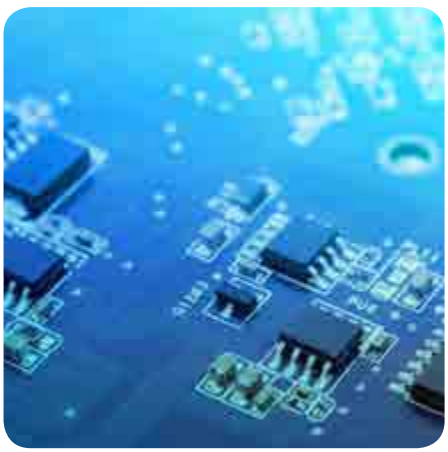
## sensiNact plays key role in FESTIVAL project

A testing platform based on the sensiNact software environment was developed under the FESTIVAL project. The platform provides access to data collected from a variety of experimental sources.

Published on 4 May 2018

## Blockchain enables real-time audits for food manufacturing

Connecting Food and List, a CEA Tech institute, have joined forces to improve quality control in the food manufacturing industry. Their solution, which leverages blockchain technology, can certify the monitoring of products from the production line to the consumer's refrigerator.



Published on 22 May 2018

## Cybersecurity: chips individually marked by e-beam lithography

A new maskless multi-beam electron lithography machine* can individually mark unique codes onto thousands of chips on the same wafer. The massively-parallel technique provides chip-marking throughputs compatible with industrial manufacturing.

Published on 12 June 2018

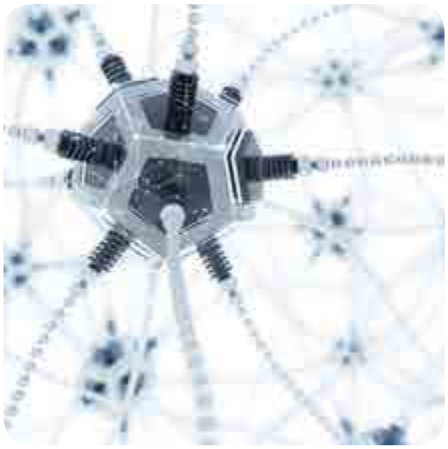
## CIVA now includes infrared thermography

CIVA, the world's leading simulation software for non-destructive testing (NDT), now has an infrared thermography module, rounding out the software's existing X-ray, ultrasonic, and electromagnetic wave inspection modules.

Published on 30 August 2018

## More accurate identification of volatile compounds

The performance of systems used to identify volatile compounds has been enhanced substantially thanks to research conducted under the Essaim project. Improvements were made to both the sensors and the data acquisition and processing methods.



Published on 1 October 2018

## Faster, more energy efficient neural networks with NeuroSpike

List, a CEA Tech institute, successfully completed the optimized execution of a complete convolutional neural network impulse model for the first time ever using its patented NeuroSpike calculator.

Published on 22 October 2018

## Easy reconfiguration of programmable components

Researchers at List, a CEA Tech institute, won first prize in the RAW competition for its smart positioning and routing software for reconfigurable architectures.

Published on 8 November 2018

## Electricity grids get even smarter

Research conducted under two EU projects has given rise to a new distributed energy management platform capable of coordinating the energy consumption of households at the scale of an entire neighborhood.

Published on 15 November 2018

## From industrial robots to cobots

Industrial robots were developed to replace human operators on repetitive or dangerous tasks. Cobots—or collaborative robots—are different. Human operators continue to use their unique know-how, while the robot works with them to make their work easier.

Published on 29 November 2018

## Euclid space telescope's structural welds inspected using ultrasonic testing

A non-destructive testing (NDT) method for inspecting sintered welds was developed to ensure the structural integrity of the European Space Agency's Euclid space telescope.

Published on 21 December 2018

## Neural networks will soon be capable of incremental learning

A method based on a model of human memory has made it possible for neural networks to learn incrementally. This advance will open the door to new possibilities in the field of autonomous systems.

CEA Tech
17 avenue des Martyrs 38044 Grenoble Cedex 9
www.cea-tech.fr