

Retrouvez tous les bulletins de Veille dans [l'espace Galaxi du pôle Veille](#)

## SOMMAIRE

### GÉNÉRALITÉS - MATÉRIAUX

- Researchers Use Electron-Based Imaging Technique to Capture Atomic-Scale Images of Polymers

### AÉROSPATIAL

- NASA looks to university researchers for innovative space tech solutions

### MATÉRIAUX POUR L'ÉNERGIE

- IoT : la technologie LAYER® génère de l'énergie grâce à la lumière ambiante
- Extending the life of low-cost, compact, lightweight batteries
- These fragile, futuristic batteries run longer with a little oil

### MATÉRIAUX POUR L'OPTIQUE

- Giant mirror-coating chamber arrives on Cerro Pachon
- Optical Surfaces to Mirror SSSL's EO Telescopes Missions

### BIOMIMÉTIQUE

- Biorobotics crée des robots qui imitent les mouvements de la nature

### COLLAGES -ADHÉSIFS

- Laser-Activated Silk Sealants Outperform Sutures for Tissue Repair

### COMPOSITES

- EPFL Researchers Develop Hydrogel that Naturally Adheres to Soft Tissue
- Cool graphene composites block EM radiation - Physics World
- 3D Crystallography Helps Visualize Particle Distribution in Metal Composites

### MÉTAUX

- Treated superalloys demonstrate unprecedented heat resistance
- Researchers Decode Mechanisms for Understanding the Properties of Aluminum Alloys

### NANOMATÉRIAUX

- Stealth-cap technology for light-emitting nanoparticles
- Nano-scale process may speed arrival

## GÉNÉRALITÉS - MATÉRIAUX

### Researchers Use Electron-Based Imaging Technique to Capture Atomic-Scale Images of Polymers

13/11/2018 - [www.azom.com](http://www.azom.com)

Every year, approximately 110 million tons of synthetic polymers like polypropylene and polyethylene are produced for these plastic products. We should be able to determine the atomic-scale structure of a wide variety of synthetic polymers such as commercial polyethylene and polypropylene, leveraging rapid developments in areas such as artificial intelligence, using this approach.

## AÉROSPATIAL

### NASA looks to university researchers for innovative space tech solutions

09/11/2018 - [www.spacedaily.com](http://www.spacedaily.com)



+ Development of a methodology for characterizing the tool/part interface in friction stir welding for improvement of predictive modeling in aluminum alloys; Brigham Young University + Multiphysics Integrated Modeling of Self-Reacting Friction Stir Welding; The Ohio State University.

## MATÉRIAUX POUR L'ÉNERGIE

### IoT : la technologie LAYER® génère de l'énergie grâce à la lumière ambiante

20/11/2018 - [siecledigital.fr](http://siecledigital.fr)



En effet cet objet imprimé pourra alimenter les objets connectés basse consommation du quotidien. Ce sera le nombre d'objets connectés à l'horizon 2020. De nouvelles technologies émergent et permettent d'alimenter des objets connectés de manière « propre » et durable. La dernière innovation by Dracula Technologies est un procédé d'impression à jet d'encre qui permet de fabriquer des modules photovoltaïques qui vont pouvoir alimenter des objets connectés. L'objet en question utilise des encres conductrices formulées à partir de composants organiques.

### Extending the life of low-cost, compact, lightweight batteries

08/11/2018 - [www.sciencedaily.com](http://www.sciencedaily.com)

The MIT design overcomes the problem of corrosion in aluminum-air batteries by introducing an oil barrier between the aluminum electrode and the electrolyte -- the fluid between the two battery electrodes that eats away at the aluminum when the battery is on standby. Hart explains that aluminum, besides being very inexpensive, is one of the "highest chemical energy-density storage materials we know of" -- that is, it is able to store and deliver more energy per pound than almost anything else, with only bromines, which are expensive and hazardous, being comparable.

### These fragile, futuristic batteries run longer with a little oil

08/11/2018 - [www.sciencenews.org](http://www.sciencenews.org)

of cheaper hi-tech products

- Watching nanoparticles

## POLYMÈRES - ÉLASTOMÈRES

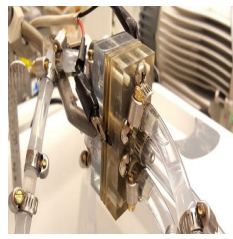
- Imprimer du Kapton en 3D c'est désormais possible !
- Epoxy compound gets a graphene bump

## REVÊTEMENTS

- Heliatek Installs PV Films on Duisburger Hafen
- Novel Anisotropic Conductive Film Could Address Electrical Short Problems in Ultra-Fine Pitch Assembly Process

## SEMI-CONDUCTEURS

- Quantum adiabatic and quantum circuit algorithms are equivalent, say physicists - Physics World
- Study opens route to ultra-low-power microchips
- Making steps toward improved data storage



Each aluminum-air battery cell contains two electrodes, an aluminum anode and a cathode, separated by a liquid called an electrolyte. Rethink In a conventional aluminum-air battery, the aluminum anode and air cathode are always separated by a liquid electrolyte. How a revamped aluminum-air battery works. " As a result, aluminum-air batteries can lose about 80 percent of their stored charge just sitting on a shelf for a month.

## MATÉRIAUX POUR L'OPTIQUE

### Giant mirror-coating chamber arrives on Cerro Pachon

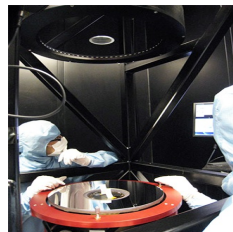
14/11/2018 - [www.spacedaily.com](http://www.spacedaily.com)



The LSST coating chamber will be used to coat both of LSST's mirrors with a highly reflective metallic layer before the 10-year survey begins and will also recoat the mirrors periodically during Operations. " Now that this important component has been successfully received on the summit of Cerro Pachon, a six-month program of assembly, integration, and commissioning for the Coating Plant will begin, culminating with the coating of the primary/tertiary mirror (M1M3) with protective aluminum, and the secondary mirror (M2) with protective silver.

### Optical Surfaces to Mirror SSTL's EO Telescopes Missions

06/11/2018 - [www.satnews.com](http://www.satnews.com)

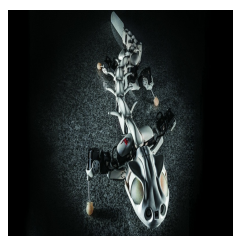


Optical Surfaces Ltd . has received an order from Surrey Satellite Technology Ltd . (SSTL) for two, high precision reference mirrors to accelerate the precise alignment and testing of their Earth Observation Satellite Telescopes. Based in Guildford, UK, Surrey Satellite Technology Limited (SSTL) manufacture and operate small to medium sized satellites, covering a range of use cases, from telecoms to Earth Observation (EO). in diameter with a central hole of 100 mm.

## BIOMIMÉTIQUE

### Biorobotics crée des robots qui imitent les mouvements de la nature

20/11/2018 - [www.3dnatives.com](http://www.3dnatives.com)



Nous utilisons la technologie de dépôt de matière fondue avec de l'ABS et polyamide, mais aussi le frittage laser. De plus, je recommanderai de ne pas faire confiance à 100% à l'impression 3D.

## COLLAGES –ADHÉSIFS

### Laser-Activated Silk Sealants Outperform Sutures for Tissue Repair

07/11/2018 - [www.techbriefs.com](http://www.techbriefs.com)

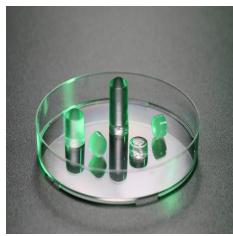
The Arizona group has developed this technology by carefully choosing and testing the materials contained in the sealant as well as the specific type of laser light needed to activate the sealant without causing heat-induced collateral tissue damage. The other type of LANS mix with water to form a paste that can be applied to superficial wounds on the skin. This type was tested on the repair of a mouse skin wound and compared to both sutured skin and skin repaired with an adhesive glue.

## COMPOSITES

### EPFL Researchers Develop Hydrogel that Naturally Adheres to Soft Tissue

21/11/2018 - [www.azom.com](http://www.azom.com)

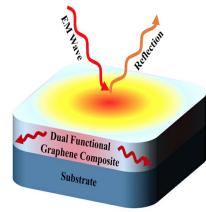
Our hydrogel is ten times more adhesive than currently available bioadhesives on the market such as fibrin. This structure maintains the strong adhesive capacity of the material by blunting the effect of mechanical stresses. "If we build on the hydrogel's remarkable adhesive



properties, that could open the door to a large number of potential applications.

### Cool graphene composites block EM radiation - Physics World

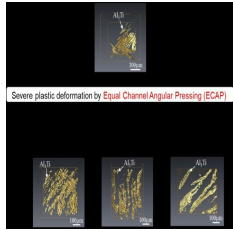
21/11/2018 - [physicsworld.com](http://physicsworld.com)



Thank you for registering with Physics World. If you'd like to change your details at any time, please visit My account.

### 3D Crystallography Helps Visualize Particle Distribution in Metal Composites

16/11/2018 - [www.azom.com](http://www.azom.com)

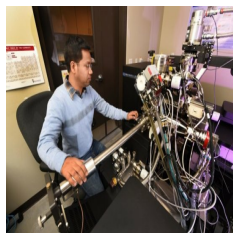


More significantly, Dr Sato added that one can control the particle distribution in the deformed composite material depending on the material flow of its matrix. The duo also discovered that the smallest Al-Al<sub>3</sub>Ti particle fragment was produced by Route Bc. The Al<sub>3</sub>Ti intermetallic particle is believed to preferentially fragment at a particular location in the deformation process, which provides one more level of control to design a better grain. Strength and ductility of the metal-based composite strongly depend on the particle size and the spatial distribution of the particle.

## MÉTAUX

### Treated superalloys demonstrate unprecedented heat resistance

16/11/2018 - [www.sciencedaily.com](http://www.sciencedaily.com)



The discovery could improve materials performance for electrical generators and nuclear reactors. This could be useful in electricity generators and elsewhere," said Subhashish Meher, an INL materials scientist. Understanding how to build an improved superalloy is important for making the metallic mixture better for a particular purpose. In a superalloy, it consists of a metallic matrix with precipitates, regions where the composition of the mixture differs from the rest of the metal. "We are now better able to dial in properties and improve material performance," Meher said. ...

### Researchers Decode Mechanisms for Understanding the Properties of Aluminum Alloys

14/11/2018 - [www.azom.com](http://www.azom.com)

Aluminum alloys are indispensable in space technology and aircraft manufacturing and possess unique material properties. Now, for the first time, scientists at [TU Graz](http://TU_Graz) applied high-resolution electron tomography to successfully decode mechanisms that are important for comprehending the properties of these alloys. The results of the study have been reported in *Nature Materials*.

## NANOMATÉRIAUX

### Stealth-cap technology for light-emitting nanoparticles

14/11/2018 - [www.nanodaily.com](http://www.nanodaily.com)

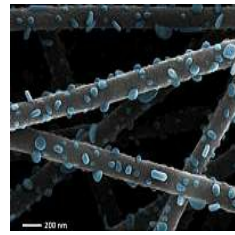
Nanoparticles are tiny structures, typically less than 100 nanometers in size, which is about 500 to 1000 times smaller than the thickness of a human hair. In order to keep the new nano-probes stable for weeks in a complex biological environment, the scientists photochemically link the components of the protective shell with each other: "We simply



irradiated our nanoparticles with UV light.

### Nano-scale process may speed arrival of cheaper hi-tech products

11/11/2018 - [www.nanodaily.com](http://www.nanodaily.com)



Engineers demonstrated their manufacturing technique, known as electrospinning, by building a fuel cell - a device that converts fuels into electrical power without combustion. It offers a high contact area between the fuel cell components and the oxygen in the air, making it more efficient. As the fibres cool to form a fuel cell component, nanocrystals emerge on their surface, creating a large surface area. Tests showed the nanofibre fuel cell performed better than conventional components.

### Watching nanoparticles

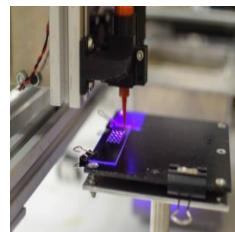
08/11/2018 - [www.nanodaily.com](http://www.nanodaily.com)

Despite heavy skepticism from the microscopy community, she and her fellow researchers were attempting a union between light microscopy and transmission electron microscopy that, if successful, would reveal a single particle undergoing a light-activated reaction. The new setup melds the resolution of electron microscopy with the color of light microscopy. The researchers could also see how each step of the reaction - the hydrogen leaving the nanocube, the lattice structure of the nanocube rearranging - is affected by different wavelengths of light.

## POLYMÈRES - ÉLASTOMÈRES

### Imprimer du Kapton en 3D c'est désormais possible !

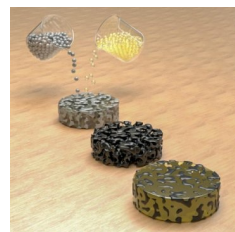
21/11/2018 - [www.primante3d.com](http://www.primante3d.com)



Le professeur Timothy Long et son équipe du département de chimie et de recherche en systèmes de fabrication additive (DREAMS ), sont parvenus à imprimer du Kapton en utilisant une technique d'impression 3D par stéréolithographie. « Parce que c'est si simple, (DIW) nous donne une incroyable souplesse en matière d'encre, de synthèse et de propriétés.

### Epoxy compound gets a graphene bump

14/11/2018 - [www.sciencedaily.com](http://www.sciencedaily.com)

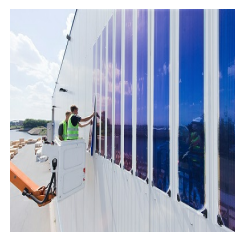


Epoxy combined with "ultrastiff" graphene foam invented in the Rice lab of chemist James Tour is substantially tougher than pure epoxy and far more conductive than other epoxy composites while retaining the material's low density. But there's a trade-off: More filler brings better conductivity at the cost of weight and compressive strength, and the composite becomes harder to process. The foam did not add significant weight to the compound, but gave it seven times the compressive strength of pure epoxy.

## REVÊTEMENTS

### Heliatek Installs PV Films on Duisburger Hafen

21/11/2018 - [www.photonics.com](http://www.photonics.com)



Equipped with a self-adhesive backing, the film can be applied directly to a variety of surfaces without further assembly efforts, and without affecting the structure underneath.

### Novel Anisotropic Conductive Film Could Address Electrical Short Problems in Ultra-Fine Pitch Assembly Process

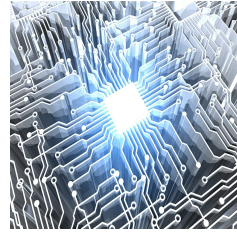
14/11/2018 - [www.azom.com](http://www.azom.com)

During the chip-on-glass assembly, the nylon films did not display any short circuit issues, and during the ultra-fine pitch applications, they also acquired high reliability, excellent electrical conductivity, and low-cost ACFs. In addition to VR, 4K, and 8K UHD display products, this new type of ACFs can also be applied to mobile devices and large-size OLED panels, says Professor Paik.

## SEMI-CONDUCTEURS

### Quantum adiabatic and quantum circuit algorithms are equivalent, say physicists - Physics World

20/11/2018 - [physicsworld.com](http://physicsworld.com)



Thank you for registering with Physics World. If you'd like to change your details at any time, please visit My account.

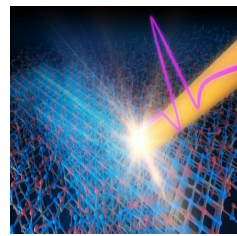
### Study opens route to ultra-low-power microchips

13/11/2018 - [www.sciencedaily.com](http://www.sciencedaily.com)

The new finding is being reported today in the journal Nature Materials, in a paper by Geoffrey Beach, a professor of materials science and engineering and co-director of the MIT Materials Research Laboratory; graduate student Aik Jun Tan; and eight others at MIT and Brookhaven. While experimenting with layered magnetic materials in search of ways of changing their magnetic behavior, Tan found that the results of his experiments varied greatly from day to day for reasons that were not apparent. ...

### Making steps toward improved data storage

09/11/2018 - [www.sciencedaily.com](http://www.sciencedaily.com)



In addition, downscaling memory sites in phase-change materials could increase memory density. Addressing this issue in an article in Physical Review Letters, a team of scientists led by Kyoto University observed nanometer-scale growth of individual crystals in a phase-change material composed of germanium, antimony and tellurium -- or GST -- after applying high-powered terahertz pulses as a trigger.

## Service Information Numérique - Pôle IES

Pour toute information, merci de [nous contacter](#)