

Matériaux

Bulletin de Veille - 04 mars 2019

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MÉTAUX

A LA UNE

Researchers combine old-school logic gates with 3D printing to create 'sentient' materials

21/02/2019 - www.3ders.org

Like LEGOs, these 3D printed logic gates could be embedded into any type of architected material and programmed to react to its environment by physically changing shape without the need for electricity. At UCLA, former LLNL postdoctoral researcher Jonathan Hopkins used a 3D printing process called two-photon stereolithography, where a laser scans within a photocurable liquid polymer that cures and hardens where the laser shines, to print a set of gates at a sub-micron level.

GÉNÉRALITÉS - MATÉRIAUX

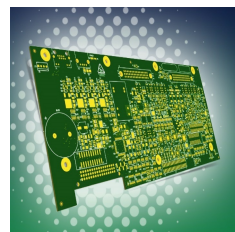
Magnetization reversal achieved at room temperature using only an electric field

22/02/2019 - www.sciencedaily.com

This represents the first time that such a feat was carried out, and could soon become the operating principle of a new type of memory device, as explains Azuma: "The current demonstration of magnetic reversal using an electric field paves the way to low power-consumption, non-volatile magnetic memories, such as magnetoresistive random-access memories.

Super PCB to Exhibit at SMTA Dallas & Houston Expos

18/02/2019 - www.azom.com

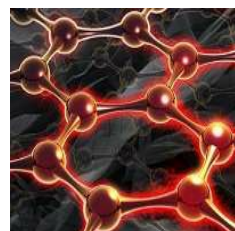


Based in Texas, company representatives will display samples of a number of current products in the fast-moving PCB industry, including single layer, two-layer, multilayer rigid PCBs, flex PCBs, rigid flex PCBs, Aluminum PCBs for LED and Rogers PCBs for RF applications, HDI and others.

AÉROSPATIAL

Chinese engineers look to graphene to drive deep space exploration

27/02/2019 - www.spacedaily.com



More than 80 percent of the takeoff weight of current carrier rockets is chemical propellants. Scientists in Europe, the United States and Japan are developing spacecraft with solar sails made with polyimide film, but the thrust is relatively weak, said Song. Previous research conducted by Professor Chen Yongsheng, of Nankai University, showed graphene can be driven by various light sources including sunlight, and the thrust generated is 1,000 times higher than that of polyimide film in vacuum conditions.

New Conductive Material, GraphON from CSIRO Holds Promise for Use in Aerospace and Defense Industries

21/02/2019 - www.azom.com

- Nanotechnology enables engineers to weld previously un-weldable aluminum alloy

NANOMATÉRIAUX

- Nano Dimension granted patent for dielectric ink
- Nanoparticle computing takes a giant step forward
- The holy grail of nanowire production
- Graphene 'sandwich' key to new electronics
- Porous Carbon Fibers Shows Potential for Use in Industrial Settings

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- Picosun's ALD yttria eliminates corrosion in demanding applications
- Thermally-painted metasurfaces yield perfect light absorbers for high-tech applications

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- New Hybrid Molybdenum-Disulfide-Azobenzene Structure is Better than Graphene
- Des composants électroniques imprimés en 3D à partir d'un dérivé du bois

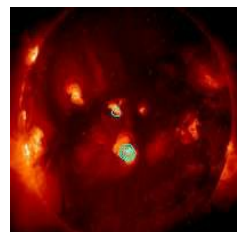
THERMOPLASTIQUES

- KRAIBURG TPE Provides Thermoplastic Elastomers with a Pleasant Feel for Nonslip Protective Frames for Devices

CSIRO , Australia's national science agency, has developed an innovative new form of graphitic material that is conductive and easy to apply and offers better control over performance than graphene. Image credit: CSIRO Furthermore, GraphON can be manufactured easier and cheaper, with higher flexibility and less harmful waste than comparable materials. The name "GraphON" indicates the presence of oxygen and nitrogen in the carbon-based structure which is easy and inexpensive to create.

Technology developed in Brazil will be part of ISS

20/02/2019 - www.spacedaily.com



The future of the equipment lies in its graphene sensors. Highly sensitive to terahertz frequencies, graphene sensors are able to detect polarization and be adjusted electronically. Experiments in creating these detectors are currently underway at the Center for Advanced Graphene, Nanomaterials and Nanotechnology Research (MackGraphe) at Mackenzie Presbyterian University, a FAPESP-funded center.

NASA to Advance Unique 3D Printed Sensor Technology

17/02/2019 - www.spacedaily.com

Under a \$2 million technology development award, Sultana and her team at NASA's Goddard Space Flight Center in Greenbelt, Maryland, will spend the next two years advancing the autonomous multifunctional sensor platform. Once printed, Sultana's group will functionalize the individual sensors by depositing additional layers of nanoparticles to enhance their sensitivity, integrate the sensors with readout electronics, and package the entire platform. "This is truly a multifunctional sensor platform.

MATÉRIAUX POUR L'ÉNERGIE

Researchers Use Different Mineral Forms of Titanium Oxide to Improve the Efficiency of Perovskite-Type Solar Cells

01/03/2019 - www.azom.com

Scientists have discovered a new way to improve the efficiency of perovskite-type solar cells by layering different mineral forms of titanium oxide over one another. In the future, this innovative technique can possibly be used for developing perovskite-type solar cells, which are even more efficient.

Fortifying Silicon with MXenes Could Expand the Capacity of Lithium-Ion Batteries

22/02/2019 - www.azom.com

Now according to a study performed at Drexel University and Trinity College in Ireland, fortifying silicon with a unique type of material known as MXene could lead to an even greater enhancement. When compared to existing graphite or silicon-carbon anodes utilized in Li-ion batteries, all three anode samples exhibited higher lithium-ion capacity and more improved conductivity—on the order of 100 to 1,000 times greater than traditional silicon anodes, upon the addition of MXene.

MATÉRIAUX POUR L'OPTIQUE

2D Material with Optically Addressable Spin Defects Shows Promise as Host for Quantum Emitters

13/02/2019 - www.photonics.com

" The researchers looked for a 2D material that would be most like a flat analog of bulk diamond and chose h-BN over graphene. Professor Annemarie Exarhos at Lafayette University said, "Graphene behaves like a metal, whereas diamond is a wide-bandgap semiconductor and thus acts like an insulator. Hexagonal boron nitride, on the other hand, has the same honeycomb structure as graphene, but, like diamond, it is also a wide-bandgap semiconductor and is already widely used as a dielectric layer in 2D electronics.

BIOMIMÉTIQUE

Nanoscale 3D printing helps reveal how firefly-inspired surface can boost LED efficiency

22/02/2019 - www.3ders.org



Scientists from Penn State University have created a new type of light-emitting diode (LED) lightbulb that could change the way we light our homes. First, the greater surface area of the asymmetric pyramids allows greater interaction of light with the surface, so that less light is trapped. To demonstrate this experimentally, the researchers used nanoscale 3D printing to create symmetric and asymmetric surfaces and measured the amount of light emitted. Posted in 3D Printing Application.

COLLAGES –ADHÉSIFS

Indium Corporation Launches InFORMS® ESM02 for Die-Level Bonding

01/03/2019 - www.azom.com

Indium Corporation is a premier materials manufacturer and supplier to the global electronics, semiconductor, thin-film, and thermal management markets. Products include solders and fluxes; brazes; thermal interface materials; sputtering targets; indium, gallium, germanium, and tin metals and inorganic compounds; and NanoFoil®. LM04 100. SM04 100.

COMPOSITES

Fortify, l'impression 3D magnétique pour l'industrie

19/02/2019 - www.3dnatives.com

Son objectif est de permettre une fabrication rapide et transparente de composites avec des microstructures optimisées – elle a donc inventé un procédé d'impression 3D magnétique baptisé Fluxprint. Digital Composite Manufacturing™ (DCM) est une plateforme de fabrication additive qui utilise des résines techniques renforcées avec des additifs spéciaux pour produire des pièces haute résolution. 3DN: Où voyez-vous le plus souvent les applications d'impression 3D magnétique?

MÉTAUX

Nanotechnology enables engineers to weld previously un-weldable aluminum alloy

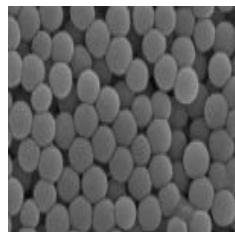
19/02/2019 - www.spacedaily.com

Although it's nearly as strong as steel and just one-third the weight, it is almost impossible to weld together using the technique commonly used to assemble body panels or engine parts. But the alloy's resistance to welding, specifically, to the type of welding used in automobile manufacturing, has prevented it from being widely adopted. .

NANOMATÉRIAUX

Nano Dimension granted patent for dielectric ink

26/02/2019 - 3dprintingindustry.com



Israel-based 3D printer manufacturer, Nano Dimension, has been granted a patent for its dielectric ink used for 3D printing electronics. Nano Dimension is known for its DragonFly Pro 3D printer, a multi-material inkjet system which can 3D print electronics. A good example of these applications are Nano Dimension's collaboration with Harris Corporation to 3D print Radio-frequency identification (RFID) chips and with PHYTEC to 3D print PCBs. For more news on the latest developments in additive manufacturing, subscribe to our 3D printing newsletter.

Nanoparticle computing takes a giant step forward

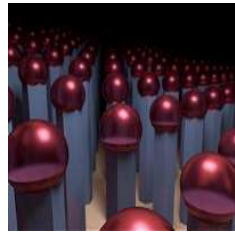
26/02/2019 - www.nanodaily.com

This manuscript reports the development of a nanoparticle-lipid bilayer hybrid-based computing platform termed lipid nanotablet (LNT), in which nanoparticles, each

programmed with surface chemical ligands (DNA in this case), are tethered to a supported lipid bilayer to carry out computation. We introduced two types of nanoparticles to a lipid bilayer that differ in mobility: mobile Nano-Floaters and immobile Nano-Receptors. A nanoparticle logic gate takes DNA strands in solution as inputs and generates nanoparticle assembly or disassembly events as outputs.

The holy grail of nanowire production

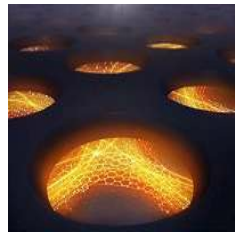
24/02/2019 - www.nanodaily.com



But researchers from EPFL's Laboratory of Semiconductor Materials, run by Anna Fontcuberta i Morral, together with colleagues from MIT and the IOFFE Institute, have come up with a way of growing nanowire networks in a highly controlled and fully reproducible manner. Getting the right ratio The standard process for producing nanowires is to make tiny holes in silicon monoxide and fill them with a nanodrop of liquid gallium.

Graphene 'sandwich' key to new electronics

22/02/2019 - www.spacedaily.com



Graphene Flagship researchers solved one of the challenges of making graphene nano-electronics effective: to carve out graphene to nanoscale dimensions without ruining its electrical properties. Daniel Neumaier, Graphene Flagship Division Leader for Electronics and Photonics Integration says: 'Controlling the electronic properties of graphene by nano-patterning offers an additional degree of freedom for the design of electronic and photonic devices, which was so far not accessible.

Porous Carbon Fibers Shows Potential for Use in Industrial Settings

20/02/2019 - www.azom.com

The long-term objective of Liu is to develop exterior car shells from porous carbon fibers that can potentially store energy inside the pores. "In a long-term vision, we could replace gasoline with just electric supercapacitor cars," stated Liu. According to him, a shorter-term application would be to use the carbon fiber parts to supply plenty of energy in a short period of time to speed up cars faster.

REVÊTEMENTS

High-Temperature-Resistant Encapsulant for Electronic Components

28/02/2019 - www.azom.com

DELO MONOPOX GE6515 is a one-component, purely heat-curing epoxy resin. In addition, the epoxy resin is highly resistant to chemicals such as oils, acids, or fuels. DELO MONOPOX GE6515 cures in an air convection oven at temperatures ranging from 90 °C to 150 °C. At 130 °C, the epoxy resin is fully cured after just 15 minutes, making production processes faster. Source: <http://www.delo.de/en/>.

Picosun's ALD yttria eliminates corrosion in demanding applications

25/02/2019 - www.azom.com

Yttria, aka yttrium oxide, Y₂O₃, is extremely hard, dense, and mechanically strong material which has excellent chemical and erosion resistance and very high melting point. Y₂O₃ also finds uses as a high-k gate dielectric in novel microelectronics such as carbon-based components, thin film transistors, and germanium-metal-oxide semiconductors. Achieving these properties with a fraction of film thickness compared to traditional methods saves costs and materials.

Thermally-painted metasurfaces yield perfect light absorbers for high-tech applications

20/02/2019 - www.sciencedaily.com

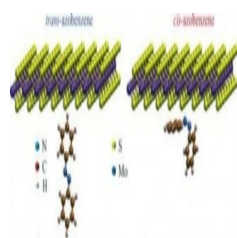
Scientists have previously demonstrated perfect light absorption using ultrathin absorptive materials on metals or with highly-engineered nanostructures. However, these

materials require at least two material depositions using nanolithography fabrication methods that are expensive, time consuming and hard to reproduce. "We showed that perfect light absorption could be realized using a simple thin-film with the right combination of oxide and metallic substrate," said Strangi.

SEMI-CONDUCTEURS

New Hybrid Molybdenum-Disulfide-Azobenzene Structure is Better than Graphene

01/03/2019 - www.azom.com



The quasi two-dimensional structure makes molybdenum disulfide as attractive as graphene in terms of space reduction and malleability, but it has virtues that potentially make it even better. It's a semiconductor with similar electrical conductivity properties to graphene's and it's more versatile optically because it emits light in the wavelength range from infrared to the visible region.

Des composants électroniques imprimés en 3D à partir d'un dérivé du bois

27/02/2019 - www.3dnatives.com

Le mélange CNF serait le plus adapté pour imprimer en 3D un circuit inducteur-condensateur sur un film de polyamide. Il conclut : "Si nous pouvons transformer les plastiques contenus dans les PCB en matériaux composites à base de cellulose, le recyclage des composants métalliques sur la carte pourrait être collecté de manière beaucoup plus simple.

THERMOPLASTIQUES

KRAIBURG TPE Provides Thermoplastic Elastomers with a Pleasant Feel for Non-slip Protective Frames for Devices

01/03/2019 - www.azom.com

These thermoplastic elastomers (TPEs) combine cost-efficient processing with excellent adhesion to polycarbonate. This processing capability with TPE not only allows high productivity and excellent energy efficiency but also avoids the problem of stress cracking, which often occurs particularly with polycarbonate. "Customers today expect technical devices to provide both functionality and a high degree of comfort and aesthetics", emphasizes Josef Neuer at KRAIBURG TPE.

Service Information Numérique - Pôle IES

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