

MINA-NEWS

MINATEC
NEWSLETTER
FEBRUARY 2020

TOP NEWS

The Di@pason project: Avalun scales up

Avalun is coordinating the Di@pason project, which will test a connected patient care pathway on a cohort of 10,000 patients on blood thinners in six regions across France. Caregivers will test Avalun's LabPad INR portable lab, which utilizes consumables manufactured at the BHT building. The connected patient care pathway could ultimately be expanded to all of France.

Avalun has already run field tests in Isère (200 patients) and in France's Meuse district (80 patients). The results were encouraging enough for the nation's healthcare authorities to approve the Di@pason project. For Avalun, this new project is a chance to scale up. The company's LabPad will be used to administer blood coagulation tests to 10,000 patients (at a frequency of one or two tests per month each).

FROM SAMPLE TO RESULT IN TEN TO FIFTEEN MINUTES

The patients in the test cohort have heart conditions that require blood thinners, which means that they have a greater risk of suffering a hemorrhage. Nurses will use the LabPad to take a blood sample (a finger prick) and do the test. A medical biology lab participating in the project will confirm the results.

If a patient's results are cause for concern, the nurse can prescribe emergency care as recommended by the patient's primary care physician. The entire test takes just ten to fifteen minutes, compared to twelve hours for a conventional lab test.

Avalun has started manufacturing the individual test supplies required for the project on its robotized pilot line at the BHT building. In mid-2021 the connected patient care pathway could be expanded to all of the 700,000 patients on blood thinners in France. The startup has other irons in the fire as well, including booming export sales to Germany, the Czech Republic, and other countries.

✉ vincent.poher@avalun.com

INNOVATION

Germanium makes a foray into spin orbitronics

Can a unidirectional magnetoresistance effect* be obtained with a semiconductor material like germanium? Researchers at Spintec found the answer, and, according to an article they recently published, it is yes! The effect had already been observed with two rarely-used non-magnetic materials. With germanium, however, the effect is 100 times more intense.

The researchers demonstrated that the effect originates in the electron gas at the surface of the material. The electrons' spin aligns perpendicular to their trajectory. A satisfactory model of the phenomenon was created in partnership with the CNRS-Thales joint research unit in physics in Palaiseau, near Paris. The research will give new impetus to the development of a spin transistor. By varying the voltage of the grid, the effect could make it possible to modify or conserve the states of the spins injected from the source.

*resistance caused by a current

✉ matthieu.jamet@cea.fr

Plastic brings surprising benefits to high-speed communications

What if an ordinary plastic tube could perform better than copper or fiber optic cable for high-speed communications? Leti has started to prove that it can with P-Link, a system that is shockingly simple. The system was able to transmit a signal from a STMicroelectronics circuit over at distance of two meters at 7 Gbit/s.

This small revolution was made possible by the use of millimeter waves (30 GHz to 300 GHz), rather than the nanometer waves used in optical communications. The radio signal is propagated inside the plastic tube and in the material itself. The losses are minimal, so the system is very energy efficient. Plastic is cheap, sturdy, and resistant to vibration and electromagnetic disturbances—qualities that could interest a number of industries, from automotive and aerospace to data centers.

✉ didier.belot@cea.fr

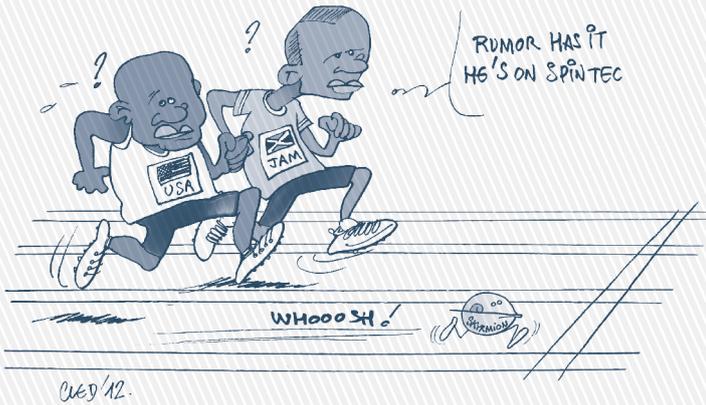
Astrophysics: IRIG technologies used to cool DESI sensors

IRIG's pulse tube cryocoolers were developed in the early 2000s and transferred to Thales in 2005. But the tiny devices are still making news! The 30 sensors that make up the DESI* spectroscopy, which will create a giant map of the sky, is cooled by the cryocoolers. Five years from now DESI will have produced the most detailed 3D map of the universe ever, and scientists will be able to use the map to go back billions of years.

The cryocoolers were chosen because their cold areas do not have any moving parts, for maintenance-free reliability. IRIG is still making improvements to the cryocoolers so that they can be used for new, colder applications. The ESA, for example, has asked for a version suitable for cryogenic chains at temperatures close to absolute zero.

*Dark Energy Spectroscopic Instrument, a joint international project involving CEA-IRFU

✉ ivan.charles@cea.fr



Skyrmions ten times faster than Usain Bolt

A team of researchers from Spintec, Institut Néel, and CNRS obtained the high-speed motion of skyrmions in a three-layered platinum/cobalt/magnesium oxide material, setting a record of 100 meters per second. Even more impressive: the record was achieved at low current densities and at ambient temperature! The key? Layers just a few nanometers thick, synonymous with very low energy consumption. With this latest feat, the nanometric quasiparticles known as skyrmions are well on their way to the finish line in tomorrow's memory and computing systems.

The skyrmions' behavior was modelled, and the observations aligned well with the theory. Spintec is leading a new project with six French and German research teams...this time to set a record of 1 km per second!

✉ olivier.bouille@cea.fr

Germanium laser operates at record low temperature of 273 K

Researchers from IRIG and Leti joined forces with a team from Switzerland* to obtain lasing at temperatures as low as 273 K (0° C) using a slightly deformed germanium/tin (GeSn) alloy resonator. Emission in the infrared spectrum is generated by optical pumping. This achievement marks a new advance toward germanium lasers integrated on silicon. The seminal article on Ge/Sn lasers, which dates back to 2015, reported lasing at 90 K.

Leti handled the epitaxial growth of crystalline GeSn on silicon wafers. IRIG made the resonators and completed the optical characterization. To get even closer to ambient temperature, the researchers are now shifting their focus to two parameters: the proportion of tin in the alloy (currently at 16%) and the intensity of the deformation applied to the material.

*Paul Scherrer Institute

✉ nicolas.pauc@cea.fr ✉ vincent.reboud@cea.fr

Thyroid surgery: FLUOPTICS® reduces the risk of complications

FLUOPTICS®, located in the High-tech Building (BHT), is getting encouraging feedback on its FLUOBEAM®LX imaging system for thyroid surgery. The system allows surgeons to clearly identify the four tiny parathyroid glands adjacent to the thyroid at the start of the surgery. This reduces the risk of accidental injury to or removal of the parathyroid glands, a complication that can have very serious consequences.

FLUOBEAM®LX uses a specific excitation wavelength that causes the parathyroid glands to emit autofluorescence without the need

for a contrast medium. The light signal emitted is detected by a high-sensitivity camera. FLUOPTICS® is the first company in the world to offer this kind of imaging system and has obtained EU and US approvals for the system. At end-2019 the company had installed seventeen of its machines at top-named surgical practices in Europe and the US.

✉ odile.allard@fluoptics.com

Heliaus project will help bring infrared to autonomous vehicles

Tomorrow's autonomous vehicles could use infrared (IR) imagers to scan the road and surrounding environment. The EU Heliaus project, coordinated by LYNRED*, is investigating the potential of this technology. The project's eleven partners, which include Leti, will receive EU funding of more than €8 million over three years.

Ultrasound, radar, LiDAR, and visible-light cameras are among the technologies in the running for environmental perception in autonomous vehicles. IR will have to prove its worth to pull ahead of the pack. Leti has been developing bolometer-based IR sensors for three decades and plans to leverage its know-how to respond to the particularly stringent cost, performance, and size requirements of the automobile industry. At the same time, the project will address a shorter-term market: driver vigilance detection.

*Founded in 2019 from the merger of Sofradir and ULIS.

✉ nicolas.liosoonshun@cea.fr

DAY BY DAY

Silicon wafers: Don't grind, recycle!

Leti's 200 mm and 300 mm research wafers, which until recently have been ground up and disposed of after use, are now sent to an aluminum foundry for recycling. The foundry was audited and its procedures for managing confidentiality were validated, and the recycling program went live in September.

The nature of the advanced components etched onto the research wafers must remain top secret. Grinding the wafers solved the problem, but created others like noise, dust, and handling. Now, the wafers are shipped in a locked truck, are stored in a secure area, and are only removed when they are ready to be melted down. The foundry recovers the silicon in the wafers, obtaining a crucial raw material at a very competitive cost. Leti has divided the cost of disposing of end-of-life wafers by six.

✉ julien.bouchard@cea.fr

Fundraising: Diabeloop gets a €31 million boost

Startup Diabeloop, which just moved into the BHT2 building, completed an impressive €31 million fundraising round at the end of November. The influx of funds will support three of the company's flagship activities: R&D to improve the DBLG1 automatic type 1 diabetes management system; clinical trials on teens and patients with very unstable forms of diabetes; and sales in France and international markets.

Diabeloop will soon apply for US FDA* approval for the DBLG1. The approval processes are also moving forward in France and Germany.

The startup, which was selected to receive support under the French Tech 120 program, currently employs 70 people, two-thirds in Grenoble. Diabeloop plans to make a number of new hires in 2020.

*Food and Drug Administration

✉ stephanie.jegu@diabeloop.fr

NuVISION, a high-potential gamma camera

Nuvia, a Vinci company, has developed a new breed of gamma camera in partnership with Leti. The NuVISION camera is making headlines for its capacity to detect, locate, identify, and measure the intensity of radioactivity. The camera met the specifications of the 2024 Paris Olympics security committee and was also named one of the most innovative technologies at the recent Milipol trade show.

NuVISION was hatched in a Nuvia-Leti joint lab that was created in 2016 and recently renewed through 2022. The CdZnTe spectrometric gamma camera was originally intended for the nuclear industry. However, it is garnering interest for homeland security applications. The camera can effectively assess how dangerous a radioactive material is and follow material that is on the move, even in a crowd.

✉ loick.verger@cea.fr

Former LMGP PhD candidate back as guest lecturer

Viet Nguyen is back at LMGP, a place he knows well, because he did his PhD and post-doc research there with David Munoz-Rojas. This time, however, Nguyen is a teacher, not a student.

The young scientist (he is still in his 20s) is already a university professor in Hanoi. Although he is based in Vietnam, he has been working with LMGP and INES to develop transparent electrodes made using deposition techniques at atmospheric pressure for photovoltaic applications. His six-week stay at LMGP will provide him with an opportunity to conduct new experiments using AP-SALD* with the goal of improving the fabrication and performance of tomorrow's PV cells.

Last fall, Nguyen's former colleagues were thrilled to see him win the *Société chimique de France* 2019 Best Dissertation Award.

*Atmospheric Pressure-Spatial Atomic Layer Deposition

✉ david.munoz-rojas@grenoble-inp.fr

Leti microcoolers earn kudos from CERN

Leti is one of four winners of CERN's 2019 Industry Awards. The award that went to Leti recognized the exceptional quality of the 52 microcoolers supplied by the institute in 2018 and 2019 as well as the partners' exemplary cooperation.

The microcoolers are currently being installed on one of the four experiments being run on CERN's LHC*. They will cool detectors placed under vacuum and continuously bombarded with high-energy particles to -20 °C. They use high-pressure CO₂ and, to prevent the risk of contaminating the detectors' electronics, must be able to withstand 180 bars without leaking. Leti rose to the challenge by adapting bonding processes commonly used on chips (2 sq. cm max.) to obtain the reliable bonding of surfaces 50 times larger.

*The Large Hadron Collider, which measures 28 km around

✉ eric.rouhouze@cea.fr ✉ catherine.charrier@cea.fr

LMGP hires two new researchers

LMGP recently welcomed two scientists. David Rousseau, a lecturer at Grenoble-Alpes University, came on board in September. He specializes in molecular and cellular biology. Rousseau is part of a lab that studies interactions between biological and other materials. His work will include investigating the stability of therapeutic proteins and synthesizing the proteins

with adhesive properties that are secreted by silkworms, spiders, mollusks, and other living organisms.

Laurent Jouffret, a CNRS research scientist, came to the LMGP Nanomat lab from the Clermont-Ferrand Institute for Chemistry in January. He is working on MAX phase materials (layered materials with remarkable thermal, electrical, and mechanical properties). Jouffret is an expert in the chemistry of fluorine, which could potentially be used to separate MAX phase materials into 2D layers.

✉ franz.bruckert@grenoble-inp.fr

Wormsensing makes any surface a touch surface

Wormsensing, a startup founded by two Leti engineers at the start of 2020, is developing a technology that can turn any product into a touch interface without altering the product's design or ergonomics. The technology, based on a piezoelectric sensor placed on the back side of the object and a processing algorithm, can detect taps/clicks, press-and-release movements, swipes, vibrations, impacts, and other touch interactions. The sensor is compatible with high-temperature manufacturing processes and is delivered in the form of an adhesive patch about as thick as a human hair.

Wormsensing, located at MINATEC, is developing technologies in four Liten patents and will be signing a R&D contract with Liten. The generic nature of the technology will be of interest to numerous markets. One example is the automotive market, always on the lookout for intuitive, invisible touch interfaces.

✉ jean-sebastien.moulet@cea.fr

HORIZONS

Biomedical research: Eveon and LMGP right on track

How do therapeutic proteins behave when they are used in automated drug preparation and delivery systems? This is the question LabCom is trying to answer. This joint lab between Eveon and LMGP was established in 2018 and is receiving IDEX funding. And, one year out, the partners are doing very well. Validation testing on the main component of Eveon's fluidics cassette, a pump, was completed and two additional pumps are under development. In personnel news, a full-time technician was hired for the project.

The researchers want to make sure that the materials, geometries, and fluidics processes used in the cassettes do not result in adsorption or aggregation of the therapeutic proteins. And, because Eveon's pumps are single-use, cost is also a major concern.

✉ marianne.weidenhaupt@grenoble-inp.fr ✉ abo@eveon.eu

Leti to send major delegation to Photonics West 2020

Leti will be at Photonics West 2020 in San Francisco through February 6. The world's largest photonics-industry event is expected to bring in more than 20,000 researchers and other industry experts. And Leti is sending 30 people this year. The jam-packed program includes an exhibit booth showcasing six technologies, around 20 papers, and a workshop expected to bring in an audience of 100. Leti CEO Emmanuel Sabonnadière will open the workshop, and Amazon Lab126's Pat Tang will speak.

The event will give Leti an opportunity to build new photonics partnerships with industrial companies from around the globe, a strategy that is actively supported by local CEA Tech representatives on the US west coast.

✉ gil.grand@cea.fr

JULIEN MOTTIN,

Application Director, Prophesee

“There is no other place in France like Grenoble for microelectronics, embedded systems, and imaging.”

MINA-NEWS: Prophesee recently set up a ten-person team at the BHT. The company also just raised €25 million in capital. What's your technology?

Julien Mottin: We are developing an “event-based” vision sensor that can detect any change within a scene with microsecond resolution. The goal is not to produce images, but to perform functions like counting on fast conveyor belts, measuring speed, analyzing the vibration of a motor, or supporting tomorrow's autonomous driving systems. These markets are all attracting some big names. We are preparing our next generation of sensors with a major global electronics manufacturer.

MINA-NEWS: What role is the team in Grenoble playing in your organization?

JM: Prophesee is based in Paris. We have 85 people there, mostly in R&D. Our team in Grenoble is working on integrating our system into our customers' technologies. They are looking at things like where to put it, and what optical and mechanical systems to use. They are also investigating software and figuring out how much processing power is needed. The integration team in Grenoble will definitely be growing. Our last round of fundraising will be used mainly for sales.

MINA-NEWS: Why Grenoble?

JM: There is no other place in France like Grenoble for microelectronics, embedded systems, and imaging. These technologies are vital to our business, and we want to work with local talent. We have already signed a contract with IRT Nanoelec to work with STMicroelectronics and Leti on 3D integration. And there are other contracts on the drawing board. ■

✉ jmottin@prophesee.ai

Bamboo mugs and organic produce: Grenoble Institute of Technology goes green

Grenoble Institute of Technology students have created a number of successful sustainable initiatives this year.

One example is Le Chalet, a nonprofit group that manages the Phelma Student Union. The group recently stopped using plastic cups and introduced reusable bamboo mugs. The mugs, which are emblazoned with the school logo, are given out at the beginning of the academic year. And students are using them—with the added bonus of a discount on their coffee.

Another successful initiative has been the organic produce deliveries organized by student government. Every other week, students, faculty, and staff can purchase 4 kg of local organic

produce for just €10. All produce comes from La Buisse (20 km from Grenoble) except for the clementines, purchased from a wholesaler this winter. A total of 95 baskets were sold in January, up from 60 in September.

✉ justine.majestelabourdenne@grenoble-inp.org

Next Minalogic Business Meetings on June 2 in Lyon

The next session of Minalogic's international business convention for digital technology (micro and nanoelectronics, photonics, software, content, and user-centered design) will be held on June 2 in Lyon. A total of 150 technology buyers and 150 technology suppliers (25% of which are from Grenoble) will benefit from a full day of targeted, high-value introductions. Potential buyers are given an opportunity to vet their prospective suppliers before the event. Suppliers can be booked for up to sixteen pre-qualified BtoB meetings. The program also includes five 30-minute talks on the topic of design.

Are you interested in attending the next session of Minalogic Business Meetings? Register online and request meetings with the contacts that interest you most!

View the full program and register online at <http://www.minalogicbusinessmeetings.com/>

✉ kate.margetts@minalogic.com

HCERES evaluations, a real nail-biter

The majority of MINATEC's labs were recently evaluated by HCERES* for the 2014–2018 period. A 23-person evaluation committee came to Leti on November 4–7. IMEP-LAHC and FMNT were audited on November 27 and 28; LMGP was audited on December 16 and 17. A lab at IRIG was evaluated in December, with seven others to follow in January. Spintec will be audited on February 4 and 5; Pheliqs is scheduled for March 26 and 27.

The evaluation process demands substantial preparation on the part of laboratory staff. One of the tasks they must complete is a written self-evaluation based on four main criteria: research activities and results, organization of the research unit and work, future prospects, and a five-year strategy. The anxiously-awaited results of the audit will be published on the HCERES website in 2020 (date to be announced).

*France's higher education and research evaluation committee

✉ LETISCIENCE@cea.fr

Unique pulsed laser deposition machine coming to BHT

Leti will be installing a Solmates pulsed laser deposition machine in the BHT between now and April. The prototype—the only one of its kind worldwide—is compatible with 300 mm processes. Leti and Solmates are engaged in a two-year joint development program to evaluate the machine's capacity to volume-produce thin-layer materials for 5G telecommunications.

This growing market requires piezoelectric materials with complex chemical compositions and very high crystalline quality. The layers can be of various thicknesses (from a few nanometers to a micron) and must be perfectly uniform. Basic research has shown that pulsed laser deposition can do all of these things. Now it is time to take the technique out of the research lab and test its industrial potential. Leti's industrial partners will be keeping a close eye on the project!

✉ bernard.andre@cea.fr

EU DigiFed project and IRT Nanoelec are bringing digital technology to SMBs

DigiFed, an EU project coordinated by IRT Nanoelec and Leti, officially kicked off on January 28 at Maison MINATEC. With a budget of €7.9 million, including €3.8 million in cascade funding for SMBs, the project will speed up European SMBs' adoption of digital technology. The first DigiFed call for projects will start in April.

Financing will mainly go to technology demonstrator projects. At the same time, two innovative financial support mechanisms for SMBs will be evaluated: The first is an affiliate program that would allow a group of SMBs to work together to mature a given technology brick. The second is a digital challenge that large corporations or mid-caps would run for European SMBs to help consolidate the value chain. IRT Nanoelec is contributing its knowledge of embedded systems security to the project.

✉ isabelle.chartier@cea.fr

LIVE FROM MINATEC

IMEP-LAHC acquires new noise characterization equipment for advanced components

IMEP-LAHC recently purchased a 300 mm manual prober station with a high-quality Faraday cage. The equipment will be used to characterize the low-frequency noise (a few mHz to 10 kHz) of transistors and microelectronic components like photodiodes.

The Faraday cage offers much better electromagnetic isolation (especially from electrical wiring) than the dark boxes widely used in lab testing. The noise characterization tests will help researchers understand the properties of the faults at the interfaces of semiconductor devices and improve the fabrication processes used to make advanced components. The tests also inform the development of circuit simulation models.

The station will be available to other research teams via the FMNT OPE)N(RA platform.

✉ mescot@minatec.inpg.fr

Congresses: 2019 a big year for Maison MINATEC

The stage at the Maison MINATEC auditorium ended the year 2019 in style, with new decorative lighting, sofas, and coffee tables—not to mention a new handicap-accessible lectern.

And, to start the year 2020, Maison MINATEC's meeting, congress, and event services were added to the main menu of the MINATEC.org website.

Last year, Maison MINATEC hosted 403 events (up 7% from 2018) attended by an impressive 38,000 people. The venue's modular spaces lent themselves to a wide variety of events, from the European Quantum Conference (more than 400 people) and the regional *Entreprendre* entrepreneurship fair (350 high-school students) to the *Parvis des sciences* science fair (3,000 visitors).

✉ audrey.scaringella@cea.fr

ESRF EBS synchrotron to reopen in six months

The world's leading fourth-generation high-energy synchrotron is getting ready to reopen. The overhaul of the EBS (Extremely Brilliant Source) synchrotron at ESRF is going smoothly and, most importantly, on schedule. The new storage ring has been installed in the ESRF building. The original ring, which was commissioned in 1994, was dismantled and the more than 2,000 tons of components removed from the site. The new X-ray beamlines use 25% less electricity than the old ones and, due to their greater coherence and brilliance, offer 100 times better performance.

The first electrons were injected on December 2 and adjustments are now being made to optimize operation. The research program will restart on March 2, and the facility is expected to reopen to outside users on August 25. Applications are already being reviewed!

✉ delphine.chenevier@esrf.fr

A cohort of 150 young researchers from GIANT to attend JSIAM 2020

On March 13 Maison MINATEC will host the 12th Junior Scientist and Industry Annual Meeting (JSIAM). The event is expected to draw 150 PhD and post-doc candidates currently doing research at labs and companies on the GIANT campus. The attendees will gain insights into the career opportunities available in industry and network with professionals.

The day-long event, which will be run entirely in English, will start with a talk by a representative of *Association Bernard Gregory* (ABG), a nonprofit PhD career advocacy group. A selection of around ten group workshops on innovation-related and practical topics (like how to create a LinkedIn profile) will also be offered throughout the day. Finally, a two-hour speed networking session will provide opportunities for participants to meet one-on-one with professionals from industrial companies.

The deadline is March 8, so register now at <http://www.jsiam.giant-grenoble.org/>

✉ hermine.vincent@cea.fr

Who is ready to develop a scientific video game... in 48 hours?

The challenge: Develop a scientific video game in under 24 hours. Impossible? We'll soon find out at the Scientific Game Jam on the weekend of February 7 to 9. The event, which was introduced in 2014 by the CEA and CNRS, will be held at the Grenoble Institute of Technology Auditorium. Each of the eight participating teams will develop a game. The teams (which total 60 competitors aged 18 to 30), include web developers, graphic designers, and gaming experts. Word of mouth was all it took to fill up all of the available slots and a substantial waiting list.

The event will open its doors to the public on Sunday at 1:30 p.m. Visitors can explore a variety of scientific, digital technology, and gaming-related exhibit booths, test the games developed during the Jam and vote for their favorite.

Learn more: <https://www.grenoblegamelab.com/>

✉ thibaut.david@cea.fr

The Biennale Arts Sciences will take a critical look at AI and climate change

The 10th Biennale Arts Sciences-Expérimenta will offer up twelve performances across the Greater Grenoble area from February 11 to 21, plus an exhibition and forum at MINATEC from February 13 to 15. The event is open to the general public.

Some 30 installations, performances, workshops, and lectures will interrogate AI and climate change from the collaborative and sometimes contrasting perspectives of artists and scientists.

Oniri 2070 will perform daily at the exhibition and will tackle the challenge of using less than 1 kWh of electricity.

The Wednesday, February 12 conference is for professionals only, and the Midi MINATEC brown bag lunch talk on Friday, February 14 will showcase Leti scientists' surprising collaboration with artists to produce images on a transparent material.

View the program and register (for the professionals-only conference): www.experimenta.fr

✉ eliane.sausse@theatre-hexagone.eu

AGENDA

February 7-9 [Grenoble Institute of Technology Auditorium]

SCIENTIFIC GAME JAM:

Develop a scientific video game in 48 hours

<https://www.grenoblegame.com/>

February 12 [Grenoble Institute of Technology Auditorium]

EXPÉRIMENTA CONFERENCE

Exploring new paradigms in response to climate change and artificial intelligence.

experimenta-journeepro.mapado.com

February 13 [MINATEC]

FIRST SESSION OF INNOTECH 2020

Nathalie.Mathieu@phelma.grenoble-inp.fr

February 15 [Grenoble Institute of Technology-Phelma and Grenoble Institute of Technology-Ense³]

ANNUAL OPEN HOUSE

alexis.sableaux@grenoble-inp.fr

March 4 [Phelma]

ISSUE NO. 2 OF THE PHELMA BIMONTHLY NEWSLETTER PUBLISHED

alexis.sableaux@grenoble-inp.fr

March 9-13 [Alpexpo]

DATE 20 CONFERENCE:

Design, Automation, and Test in Europe

<https://www.date-conference.com/>

March 13 [Maison MINATEC]

12TH JUNIOR SCIENTIST AND INDUSTRY ANNUAL MEETING (JSIAM), for GIANT campus PhD and post-doc candidates

<http://www.jsiam.giant-grenoble.org/>

June 2 [Lyon]

MINALOGIC BUSINESS MEETINGS

www.minalogicbusinessmeetings.com

June 2-5 [MINATEC and Europe]

GRAPHENE 2020 Conference featuring four Nobel Laureates in physics

<http://www.grapheneconf.com/2020/index.php>

June 22-26 [MINATEC]

LETI INNOVATION DAYS 2020

<http://www.leti-innovation-days.com/>

CONTACTS



MINA-NEWS is published by MINATEC 3, parvis Louis-Néel – 38054 Grenoble cedex 9, France

Head of Publication: Jean-Charles Guibert - Editor-in-Chief: Julie Spinelli

Contributors: Marion Levy, Leti, marion.levy@cea.fr

Nathalie Mathieu, Phelma, FMNT, nathalie.mathieu@phelma.grenoble-inp.fr

Patrick Warin, INAC patrick.warin@cea.fr, Julie Spinelli, MINATEC, julie.spinelli@cea.fr

Alexis Sableaux, Phelma, alexis.sableaux@phelma.grenoble-inp.fr

Editing: Benoît Playoust and Bénédicte Magne | Graphic design: studio kolza [Lyon] | English translation: SFM Traduction