



IMPACT ON INDUSTRY

SUCCESS STORIES WITH BUSINESS
AT THE ESRF



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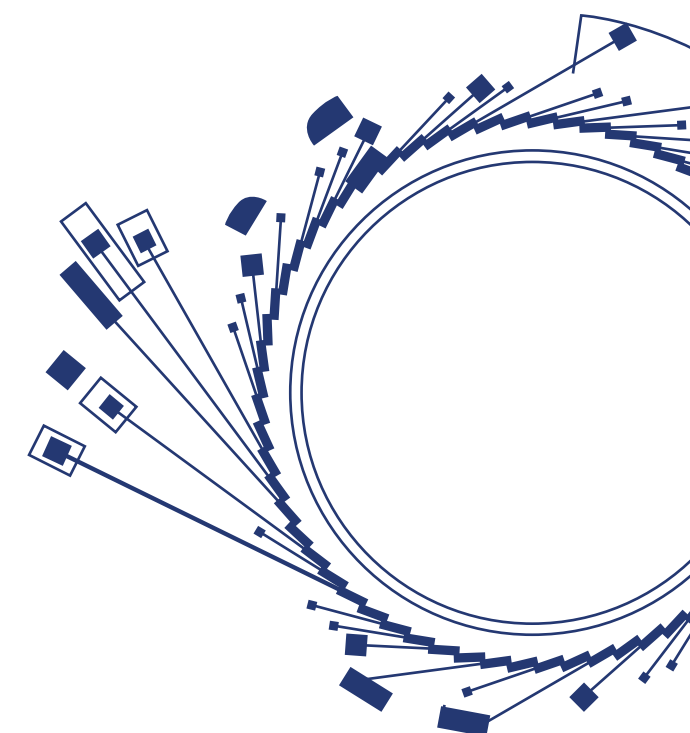
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WELCOME TO THE ESRF

The ESRF – the European Synchrotron – is the world’s brightest synchrotron light source, providing scientists with brilliant X-rays to unveil the structure of materials and the mechanisms of life. Funded by 22 partner countries, the ESRF is a landmark for fundamental and innovation-driven research, welcoming around 10 000 scientific visitors each year. With its new Extremely Brilliant Source (EBS), the ESRF provides unique facilities for researchers to tackle the complex global challenges facing our society, such as health, new materials for industry, clean energy and climate change.

Located in cosmopolitan Grenoble, France, the ESRF enjoys a strategic position within the European Photon and Neutron (EPN) Science Campus, a vibrant hub of major research institutes (the ESRF, the ILL, the EMBL and the IBS) devoted to the exploration of living matter and materials.

The ESRF is also an active partner of the GIANT (Grenoble Innovation for Advanced New Technologies) innovation campus and of the Université Grenoble Alpes (UGA).



“The ESRF is a major driver of industrial research and innovation, supporting industry in providing technological solutions to global challenges, and boosting competitiveness.”

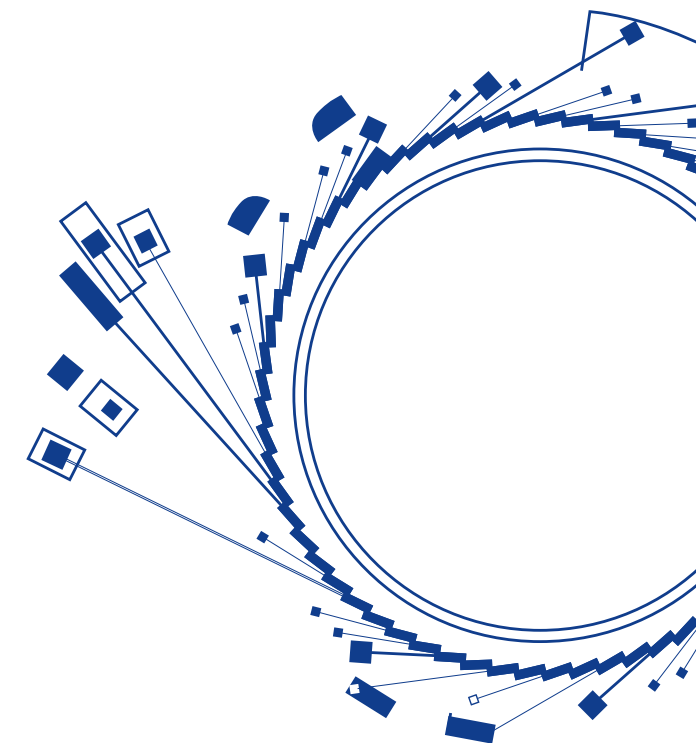
Francesco Sette,
ESRF director-general

OUR IMPACT ON INDUSTRY

The ESRF provides X-rays 100 billion times brighter than conventional X-ray sources, making it a unique place to solve problems across all industrial sectors.

The impact of the ESRF on industry is huge. Companies exploit its state-of-the-art instrumentation, benefit from the procurement of advanced technology and collaborate on research. Over 300 commercial clients use the ESRF for proprietary studies, and some 30% of the public research performed at the ESRF involves an industrial partner.

The following pages present just a few of our industrial success stories – from determining the best antibodies for disease, to identifying the strengths and weaknesses of new engineering materials, to exposing pathways to sustainability. Discover why companies from all over the world choose to work with us to become more competitive, open new international economic opportunities and push the boundaries of innovation.



AIRBUS

RADIATION-PROOFING ELECTRONIC COMPONENTS FOR SATELLITES

THE COMPANY

Airbus is one of the world's largest aerospace companies, with over 130 000 employees and a turnover approaching €50bn. Although best known for its airliners, the European corporation is also the world's largest supplier of Earth observation satellites, and one of the top manufacturers of telecommunication satellites.

THE WORK

Space weather is a major problem for satellites. Consisting of very high-energy particles flying through space, it can ionise electronic components, causing them to fail. In the past, aerospace companies have tested how resistant their components are to space weather by irradiating them with lasers or at particle accelerators, but these types of radiation do not penetrate as deeply as the real thing.

By contrast, synchrotron X-rays are highly penetrating. In 2018, Airbus became the first company to use the ESRF's ID09 beamline to run an irradiation test on a state-of-the-art, stacked electronic device – in this case a stack of flash memory cells. The test proved that X-rays can cause

**“Our ESRF work
proved we can do X-ray
irradiation testing
in Europe.”**

Cécile Weulersse,
electronic engineer, Airbus

ionising events similar to those generated by space weather, even deep inside stacked components. Similar testing is now available routinely via the Platform for Advanced Characterisation Grenoble (see box).

THE IMPACT

“For several years, aerospace scientists in the US have been using X-rays for irradiation testing: our work at the ESRF proved we can do the same in Europe. It has also paved the way for greater testing of stacked, three-dimensional components, to reduce the risk of their failure in space. These components are faster and more compact than their flat counterparts and, as a result, are being increasingly used. Currently, Airbus is pursuing irradiation testing at the ESRF indirectly, by sponsoring a research project at the IRT Saint Exupéry in Toulouse, France. However, I expect that Airbus will return to the ESRF in the future to test specific components that cannot be characterised at standard heavy-ion facilities, to ensure the longevity of our latest satellites in orbit.”

CÉCILE WEULERSSE, ELECTRONIC ENGINEER, AIRBUS •

KEY FACTS

- The Platform for Advanced Characterisation Grenoble provides routine testing for radiation damage using the combined facilities of the ESRF and the Institut Laue-Langevin on the EPN campus, and the Laboratory of Subatomic Physics and Cosmology in Grenoble.
- It is part of the Technological Research Institute (IRT) Nanoelec, an initiative of the French government to promote innovation in the micro- and nano-electronics sector through public-private partnerships.
- For more information, please visit: www.pac-grenoble.eu





ASTRAZENECA

THE KEY ROLE OF THE ESRF FOR DRUG RESEARCH

THE COMPANY

AstraZeneca was founded in 1999 with the merger of Astra AB in Sweden and Zeneca in the UK. With an annual turnover in the region of \$26bn, it is one of the world's largest pharmaceutical and biotechnology companies. A site in Gothenburg, Sweden, one of the company's three strategic centres, employs more than 2400 people from 50 countries.

THE WORK

Since the company was founded, AstraZeneca Gothenburg has been using the ESRF's world-leading macromolecular crystallography (MX) beamlines for research into respiratory, cardiovascular and renal diseases. These beamlines resolve high-resolution structures of potential drug candidates, to show whether the candidates bind to the targets of disease in an effective way. The beamlines are accessible remotely, in some cases are fully automated, and have recently begun to allow scientists to simply mail in their samples and download the data when they are ready.

Like many large pharmaceutical companies, AstraZeneca Gothenburg used to have its own X-ray crystallography facilities. In 2019, however, the company decided to abandon these due to the unrivalled quality of data available at the ESRF and other synchrotrons, and their increasingly easy access. It now uses the ESRF and other synchrotrons for all its crystallographic drug research.

“Without synchrotrons such as the ESRF, we would not be able to perform structure-based drug design.”

Linda Öster, structural biologist,
AstraZeneca Gothenburg

THE IMPACT

“Without synchrotrons such as the ESRF, we would not be able to perform structure-based drug design. We are a big company with big expectations – everything should work smoothly and excellently, and at the ESRF it does. The ESRF has always been at the forefront of synchrotron technology, and we like that. Its MASSIF-1 beamline, which we can use completely unattended, is very impressive; we can capture really good data from 100 samples in a single shift. Several drug candidates for asthma and cardiovascular disease that we have explored at the ESRF are currently in clinical trials.”

LINDA ÖSTER, STRUCTURAL BIOLOGIST, ASTRAZENECA
GOTHENBURG •





FINDEN & NOVITOM

HELPING INDUSTRY NAVIGATE LARGE RESEARCH FACILITIES

**“As a result of the
catalytic-converter study
at the ESRF, everyone
in Europe is breathing
cleaner air.”**

**Simon Jacques, co-founder
and director, Finden**

KEY FACTS

- Many other expert service companies have been created in order to facilitate industrial access to large research infrastructures such as the ESRF.
- Such companies form a micro-industry themselves; they grow as they help other companies to solve research-and-development problems that would be impossible to tackle using conventional sources.
- For more information on expert services companies, please visit www.mixn.org

THE COMPANIES

Finden and Novitom are both examples of expert service companies that help industries access large facilities such as the ESRF (see box). Starting trading in 2013, and based on the Harwell Campus near Oxford, UK, Finden has seven employees and a turnover of about €475k. Meanwhile, Novitom was founded in 2011; it has 15 employees, sites near both the ESRF and SOLEIL synchrotrons in France, and a turnover of about €1.3m.

THE WORK

As experts in cutting-edge instrumentation, Finden researchers typically acquire data from the ESRF and other facilities on behalf of their clients. In one project with a leading chemical company, Finden researchers employed chemical imaging at the ESRF to map the chemical species inside a catalytic converter at different stages of ageing. The results allowed the company to see the pathways of deactivation, and to redesign the device to last longer.

Meanwhile, Novitom specialises in materials characterisation, non-destructive testing and microanalysis, based on synchrotron techniques such as tomography and diffraction. Using the ESRF, it has helped aerospace companies to develop additive manufacturing; medical companies to improve quality control; and automotive and energy clients to expose defects in critical components, to give a few examples.

THE IMPACT

“The ESRF staff have a can-do attitude, and their techniques are cutting-edge. Our work allows companies to tweak their products in ways that have big, real-world impacts. As a result of the catalytic-converter study, for example, everyone in Europe is breathing cleaner air.”

SIMON JACQUES, CO-FOUNDER AND DIRECTOR, FINDEN

“Because techniques are evolving so fast, it’s not always clear to industry exactly how synchrotrons can help. We identify what techniques can solve their R&D problems, as well as provide expert assistance and easy-to-use software. The ESRF therefore has a twofold impact – on our company, and on the companies we serve.”

BARBARA FAYARD, CO-FOUNDER AND CEO, NOVITOM •

PRIOR PLM MEDICAL

MAKING ASTHMA INHALERS GREENER AND MORE ROBUST

THE COMPANY

Prior PLM Medical (PPLM) is a research, design and development company that specialises in drug-delivery systems, respiratory devices and injectables. Serving the medical-device and pharmaceutical industries, it manages the entire life cycle of products, from concept research through to product development, tooling project-management, manufacturing and industrialisation. It has 50 employees at its base in Carrick-on-Shannon, Ireland, and an annual turnover of €3.8m.

THE WORK

PPLM have been coming to the ESRF to study asthma inhalers since 2013. The high-energy X-rays at the ESRF allow PPLM's researchers to examine the workings of the inhalers and other medical devices during use.

In dry-powder inhalers, for instance, ESRF X-rays reveal the movement of components inside the dose counters, trigger mechanisms and dosing events, allowing their interactions to be observed during normal use, or even misuse. Another aspect of interest is how the inner geometry of an inhaler affects the flow of dry-powder medicant to a user's lungs. Here, high-speed X-ray imaging at the ESRF can produce real-time videos of the drug particles in flight, even examining the flow dynamics within individual dose capsules and vortex chambers.



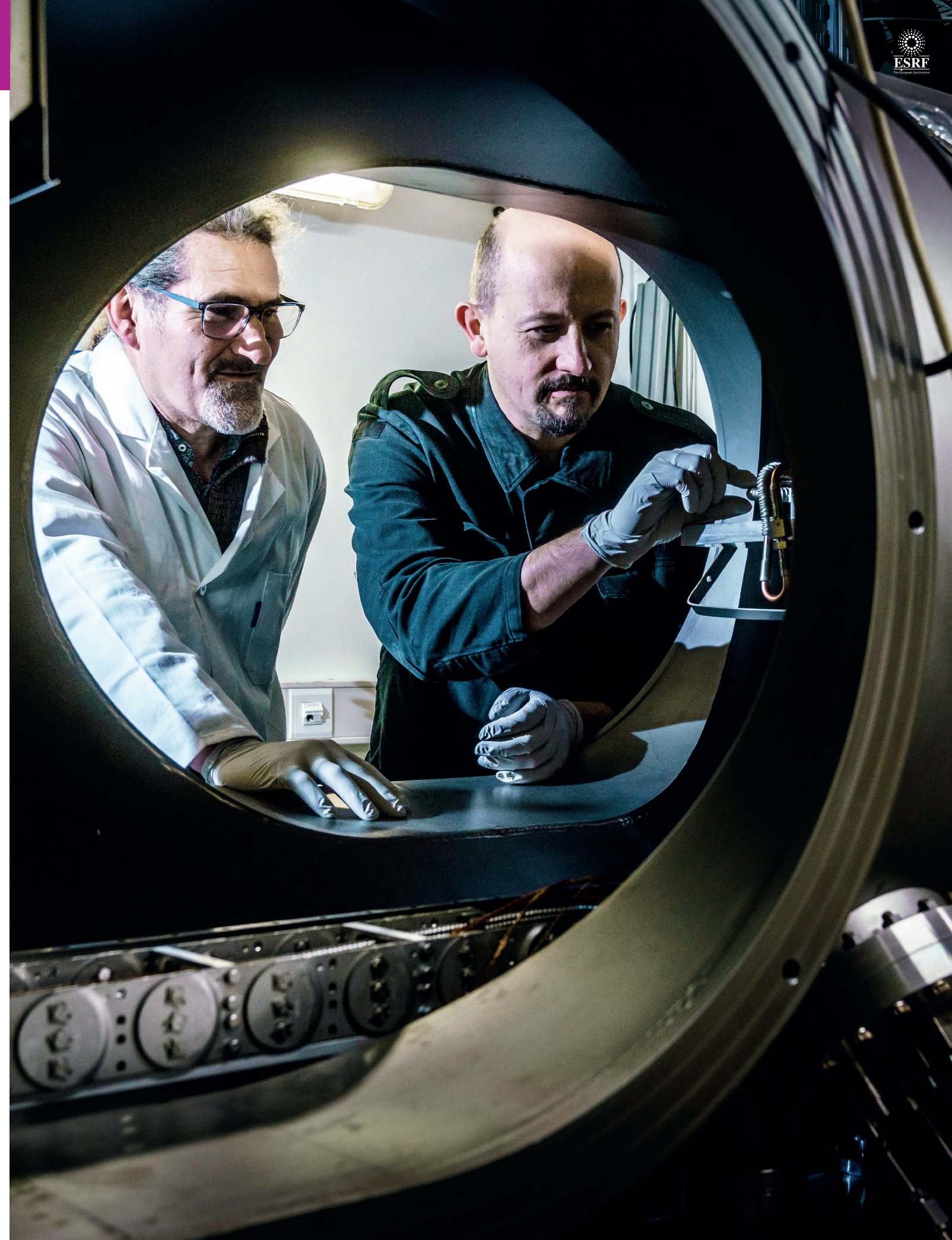
“The ESRF is an amazing facility - very welcoming, very accommodating.”

Alan McKiernan, research manager,
Prior PLM Medical

THE IMPACT

“The ESRF is an amazing facility. As a physicist, it is an exciting place to work – very welcoming, very accommodating. The data have informed designs of inhaler that are just now beginning to appear on the market – ones that are more user-friendly, especially for very young and very old asthma sufferers. We are spending a lot of time looking at pressurised metered-dose or ‘press-and-breathe’ inhalers, which currently use a propellant known as hydrofluoroalkane, a greenhouse gas. With the advent of new regulations, we’ll be back at the ESRF often in the coming years to study alternative greener propellants, and how to accommodate their very different properties.”

ALAN MCKIERNAN, RESEARCH MANAGER, PRIOR PLM MEDICAL •





BASF

THE FASTEST WAY TO ANALYSE BATTERY SAMPLES

THE COMPANY

BASF is the largest producer of chemicals in the world. A European multinational, it has subsidiaries and joint ventures in over 80 countries, a revenue in excess of €80bn and more than 110,000 staff. A third of these employees are based at the company's headquarters in Ludwigshafen, Germany.

THE WORK

Batteries are a key technology in the transition to climate neutrality and circular economies, but they do not always deliver the power we need. In pursuit of better lithium-ion batteries – the most common type in consumer electronics and electric vehicles – researchers at BASF's Ludwigshafen site are keen to optimise the synthesis parameters of lithium – nickel–manganese–cobalt oxides, which constitute the positively charged cathodes. This means analysing one sample after another, which can be an incredibly time-consuming task with lab instrumentation.

“The automated solution that the ESRF came up with was better than I expected!”

Bernd Hinrichsen, research manager, BASF

THE IMPACT

“When one of our battery specialists asked me if we could cope with 1000 samples a week, I knew it was not something we could do with our lab instrumentation. But I had been following the EBS upgrade at the ESRF, and the higher X-ray brilliance. I thought, this could be one killer application for all those photons coming out of the tube. In fact, the automated solution that the ESRF came up with was better than I expected. In just one second, the beamline could record data of a single-to-noise quality that would have taken us about a week. We've since promoted the project into a venture within BASF's business incubator.”

BERND HINRICHSSEN, RESEARCH MANAGER, BASF •

KEY FACTS

- STREAMLINE is a project that has complemented the ESRF-EBS upgrade by enhancing user operation through new procedures and systems.
- Funded by the European Commission's Horizon 2020 programme, it aims to maximise the potential to users – as swiftly as possible – of the extreme brilliance and coherence of the new X-ray beams. This is being achieved with new user operation procedures, new access modes, new training and new services, including automation.



AMADEMA

STRONGER AND LIGHTER COMPOSITE MATERIALS

**“The synchrotron results
surpassed our expectations in
terms of detail and resolution.”**

Vassilis Drakonakis, managing director, AmaDema

KEY FACTS

- Tailor-made for SMEs Trans-national Access (TamaTA) is a programme that helps and encourages small-to-medium enterprises to access world-class accelerator-based light sources in Europe and in the Middle East, to boost their innovation and competitiveness.
- It is one of many activities of LEAPS-INNOV, a project funded by the European Commission's Horizon2020 programme to boost light-source access.

THE COMPANY

AmaDema was founded in Nicosia, Cyprus, in 2016 to manufacture a new product that makes fibre-reinforced polymer composites stronger and lighter. Today it has 14 employees and an annual turnover of €600k.

THE WORK

Fibre-reinforced polymer composites are increasingly adopted for tasks that demand strength without weight. Made of glass, carbon or other fibres embedded in epoxy or other polymers, they are used in a range of industrial sectors – aerospace uses them instead of aluminium alloys, for instance. NanoWeld™ by AmaDema makes these composites up to 20% stiffer and 100% tougher, while offering substantial weight-saving opportunities. NanoWeld™ consists of a dry membrane that sandwiches existing technical fibres before they are embedded in their polymer matrix. Inside the membrane are non-woven polymeric nanofibres, which themselves include nanoparticles.

AmaDema scientists wanted to study the membrane in more detail to see if they could improve it, but lab techniques such as scanning electron microscopy only delivered fuzzy, 2D images. They wanted to see if synchrotron X-ray nanotomography could help visualise the membrane in high-resolution 3D, and so they applied for access to the ESRF via the TamaTA-Innov programme (see box).

THE IMPACT

“We wanted a proof of concept, to see whether we could actually see anything. In fact, the synchrotron results surpassed our expectations, in terms of detail and resolution. They showcased the intricate and complex structure of the interfaces between the nanofibres in our membrane and the carbon fibres of the host technical fabric; we could reconstruct it entirely in 3D. We hope that the results will help us design protocols for a better distribution of the polymer matrix during manufacture. Also, the turnover of the results was immediate, and the communication with the ESRF staff was excellent. Overall, our experience with the ESRF was exceptional.”
VASSILIS DRAKONAKIS, MANAGING DIRECTOR, AMADEMA •

AVS

BEEFING UP BIG SCIENCE

THE COMPANY

AVS was founded in Eibar, Spain, in 2006 as a “transversal” company, able to solve different problems for big-science facilities and aerospace rather than specialising in one type of product or service. Today it has some 100 employees, a turnover of €15m, and develops and supplies in a number of areas, including large vacuum chambers and in-vacuum precision mechanics.

THE WORK

The first contract AVS won from the ESRF was the construction of a high-precision detector tube for the ID02 small-angle X-ray scattering (SAXS) beamline in 2012. This “camera” consists of a 33-metre-long, two-metre-diameter vacuum tube, in which a detector can move about with sub-millimetre precision, on a wagon with a mass of over four tonnes.

AVS’s most recent contract for the ESRF, however, was the delivery between 2016 and 2018 of half of the 129 steel girders for the synchrotron’s Extremely Brilliant Source (EBS) upgrade. These girders support the cutting-edge magnets and

“Since our ESRF work, our growth in activity for synchrotrons has been exponential.”

Pedro Noguera Crespo,
project manager, AVS

instrumentation for the new X-ray source, which means that AVS had to make them very stable and with a very tight tolerance. Each girder is over five metres long and 12 tonnes in mass, yet with a flatness within 40 microns.

THE IMPACT

“AVS had limited interactions with synchrotrons before it started the SAXS tube project. The design was a collaborative effort that took a year, and marked a turning point for us at the ESRF, proving that we could build systems that nobody had ever considered before. The girders project was even more ambitious, and again we acquired new confidence and expertise, in particular maintaining quality in serial production over a long timeframe. Our subsequent growth in activity for synchrotrons has been exponential, and if we had the opportunity to quote for the same project again, we would quote for all the girders, not just half. With other synchrotrons planning to upgrade their sources, I expect that we may have that opportunity soon.”

PEDRO NOGUERA CRESPO, PROJECT MANAGER, AVS •

KEY FACTS

- For the ESRF’s EBS upgrade, more than 100 companies supplied parts and services each worth more than €50k. The ESRF’s purchases totalled over €100m.
- The suppliers were mostly in the electrical, mechanical-machining and vacuum sectors, based throughout Europe and beyond.





PRIME ELETTRONICA

SUPPLYING THE 'FERRARI' OF MOTOR CONTROLLERS

THE COMPANY

Prime Elettronica was founded by a 25-year-old employee of a large electronics firm in 1995, with the idea of specialising in the final assembly (as opposed to the manufacture) of printed circuit boards (PCBs). Based near Cornedo Vicentino, Italy, it currently has 30 employees and a turnover in the region of €6m.

THE WORK

The way in which components such as resistors, capacitors and microprocessors are assembled on a PCB greatly affects the performance of the final device. Prime specialises in this assembly for small-batch PCBs of high complexity – a market that larger electronics companies struggle to cater for cost-effectively. Prime's first customer was the Italian National Institute of Nuclear Physics; shortly after, it supplied PCBs for a particle detector at CERN.

It was while working at CERN that Prime was introduced to an ESRF employee, who suggested that the company could participate in a tender for the supply of a high-resolution motor-control system, IcePAP. Developed by the ESRF, but used by

“With the ESRF, we were able to grow and learn.”

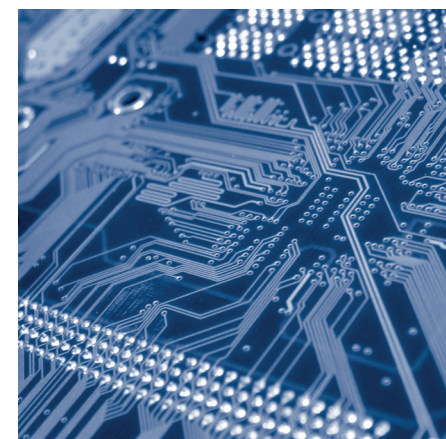
Andrea Greco, founder and director, Prime Elettronica

many other scientific facilities, IcePAP is regarded as the “Ferrari” of motor controllers, able to drive up to 128 axes of movement while being fully software-configurable and easy to diagnose if problems arise. Since 2015, Prime has supplied over 2500 IcePAPs.

THE IMPACT

“IcePAP was a big tender for us. Our experience was with electronics, but this system also required integrated mechanical parts – fortunately we knew of a good supplier for those, based just 40km away from us. The tender was also interesting because we were small compared with the other companies participating – in fact, I think this why we were able to keep our costs down, and why we won. Of course, this was not the first time that tenders had been sought for the supply of IcePAPs, and that was helpful for us because the ESRF knew exactly what it wanted. Comparing our knowledge with the ESRF's, we were able to grow and learn to present more formally.”

ANDREA GRECO, FOUNDER AND DIRECTOR, PRIME ELETTRONICA •



NH THERAGUIX

FROM SHINING X-RAYS TO NEW DRUGS FOR CANCER

THE COMPANY

Based in Grenoble, France, NH TherAguix was founded in 2015 by a former ESRF employee, with the goal of bringing an innovative cancer nanodrug, AGuIX, to market. Six years later, it has 18 employees and is engaged in nine clinical trials, including phase-two clinical trials.

THE WORK

Géraldine Le Duc began working at the ESRF's ID17 biomedical beamline in 1997, aiming to develop a single drug that could act both as a contrast agent for magnetic-resonance imaging (MRI) and a radio-enhancer for radiotherapy. Radio-enhancers improve the ability of X-rays to kill tumours. By combining one with a contrast agent, Le Duc's idea was that radiotherapy could take place just after an MRI scan, improving the precision of X-ray delivery and saving more healthy tissue from X-rays. She eventually developed AGuIX based on the element gadolinium. This contrast agent was being researched by an independent ESRF user, Olivier Tillement at the University of Lyon in France; together, he and Le Duc discovered its radio-enhancing effect.

“The ESRF was very important to my story.”

Géraldine Le Duc, founder and CEO,
NH TherAguix

In 2015, Le Duc left the ESRF in order to create NH TherAguix and bring AGuIX to market. In its phase-one clinical trials focused on brain metastases, 13 out of 14 tested patients exhibited a clinical benefit. It plans an initial public offering on the Euronext Growth market in Paris.

THE IMPACT

“Very few companies developing cancer drugs find success. But I thought, if you don't try after working for 20 years in the lab, what else can you offer? The ESRF was very important to my story – so important that it co-owns one of our patents. It is a melting pot of users working on different types of nanoparticles, which helped me figure out what worked and what didn't. Also, at a synchrotron you can explore a much larger range of X-ray parameters than at a hospital X-ray machine, and therefore be more creative with protocols. We hope that AGuIX will be registered by 2025, to improve cancer survival rates and quality of life.”

GÉRALDINE LE DUC, FOUNDER AND CEO, NH THERAGUIX ●



SEF TECHNOLOGIES

ELECTROMAGNETS, FROM MANUFACTURE TO TESTING

THE COMPANY

For 40 years, SEF Technologies has been manufacturing electromagnets for particle accelerators such as CERN, SOLEIL and the ESRF. Electromagnets are fundamental components of these big-science facilities, used to steer and focus particle beams. Based in Toulouse, France, the company has 15 employees and an annual turnover of €1.1m.

THE WORK

Historically, SEF has been a supplier to the ESRF: it provided electromagnets for the synchrotron's original storage ring, as well as for the synchrotron's new storage ring, the Extremely Brilliant Source (EBS). As is common in these cases, the ESRF performed its own testing of the magnets to make sure they conformed to design specifications and to make adjustments as necessary. For the EBS upgrade, the ESRF developed its own magnet testing benches, based on the latest "stretched-wire measurement" (SWM) technology.

"Our purchase of the ESRF's SWM bench was a strategic decision. Our investment has already paid off!"

Eric Fanio, CEO, SEF Technologies

On completion of the EBS upgrade, SEF switched from being a supplier to an ESRF customer by arranging to buy one of these testing benches. At about 10% of its annual turnover, the purchase has been a significant investment for the small company. However, it has already enabled SEF to offer magnet testing as an additional service to its clients.

THE IMPACT

"Our purchase of the ESRF's SWM bench was a strategic decision. Several of our larger competitors already offer magnetic measurement as a service. The new bench is helping us transition from being a pure manufacturing company to a more integrated-technology company that can model, design and measure magnets, as well as build them. Meanwhile, it is good for our clients because they will be getting pre-characterised magnets and will no longer have the expense of doing this kind of testing in-house. Recently, we won a call for tender on the basis that we could test as well as supply the electromagnets. As a result, the investment has already paid off!"

ERIC FANIO, CEO, SEF TECHNOLOGIES •



CONSTELLIUM

THE CULTIVATION OF INNOVAXN

THE COMPANY

Constellium is a global producer of high-performance aluminium alloys. Primarily serving the aerospace, automotive and packaging industries, it has dozens of research and manufacturing sites across the world, some 12 000 employees, and a turnover of €4.9bn in 2020.

THE WORK

InnovaXN (pronounced “innovation”) is a doctoral training programme in which students are supervised jointly by companies, academic institutions and the ESRF and/or the Institut Laue-Langevin (ILL) on the EPN campus. Launched in 2019 by the ESRF and ILL, its aim is to match synchrotron X-ray and neutron research to the needs of European companies, and to create deeper and longer-lasting relationships between big-science and industry (see box).

Constellium was one of the first industrial participants in the programme. In partnership with the SIMaP lab at the Université Grenoble Alpes, it is co-supervising a PhD student who is investigating the influence of various processing stages on the microstructures of thick aluminium plates for

“The ESRF is a unique facility; we could not do our experiments elsewhere.”

Alexandre Barthelemy and Melanie Ollat, R&D engineers, Constellium

aeronautic applications. Under the supervision of Julie Villanova at the ESRF’s ID16B beamline, the student is employing X-ray nanotomography to witness the development of these microstructures while processing is taking place. Further work at the ILL will expose any trapped hydrogen, which may affect the evolution of the aluminium’s porosity.

THE IMPACT

“We already had the pleasure of supervising a PhD student at the ESRF three years ago, so when we became aware of the InnovaXN programme we immediately wanted to participate. We particularly liked the fact that so many skills and facilities are involved: on the same location, you have both the ESRF and the ILL, and then nearby the Université Grenoble Alpes, which has a wide range of its own laboratories. Obviously, the ESRF is a unique facility; we could not do these experiments elsewhere. But more important for us is the nature of the InnovaXN programme, which attracts the best students from over the world, and presents a great opportunity for future hiring.”
ALEXANDRE BARTHELEMY AND MELANIE OLLAT, R&D ENGINEERS, CONSTELLIUM •

KEY FACTS

- The InnovaXN programme is partially backed by the European Commission as a Marie Skłodowska-Curie Action (MSCA) COFUND, and partly by the ESRF, the ILL, and industrial and academic partners, including Université Grenoble Alpes.
- The programme currently supports 40 PhD students alongside 40 company researchers, with project topics ranging from the curing of industrial coatings to the impact of enzymes on skin disorders, and to the performance of sustainable concrete binders.
- For more information, visit www.innovaxn.eu





S2INNOVATION

TAKING ESRF CO-DEVELOPED SOFTWARE TO INDUSTRY

THE COMPANY

S2Innovation makes dedicated software to control and monitor large-scale processes, largely based on Tango, a controls “toolkit” developed by the ESRF and other light sources. Formed in 2017, the company is furthering the exploitation of Tango for big science and industry. It is based in Krakow, Poland, and currently has 11 employees and a turnover of €300k.

THE WORK

Tango is an open-source software toolkit that excels at communicating with very different species of hardware. The ESRF invented the underlying concept more than three decades ago to control its original accelerator complex, although Tango itself is a more recent co-development with other synchrotron light-sources in Europe. Thanks to its increasing uptake, several computing companies have begun to offer Tango support.

One of those is S2Innovation, which has the specific goal of taking Tango’s benefits to industry. Although the young company’s clients are only scientific facilities at present, it is in talks with those in industry. Its offering is a bespoke, cloud-based system that employs Tango controls to manage all sorts of hardware, and to alert operators to faults in large-scale processes.

“There is a collaborative spirit when we work with the ESRF.”

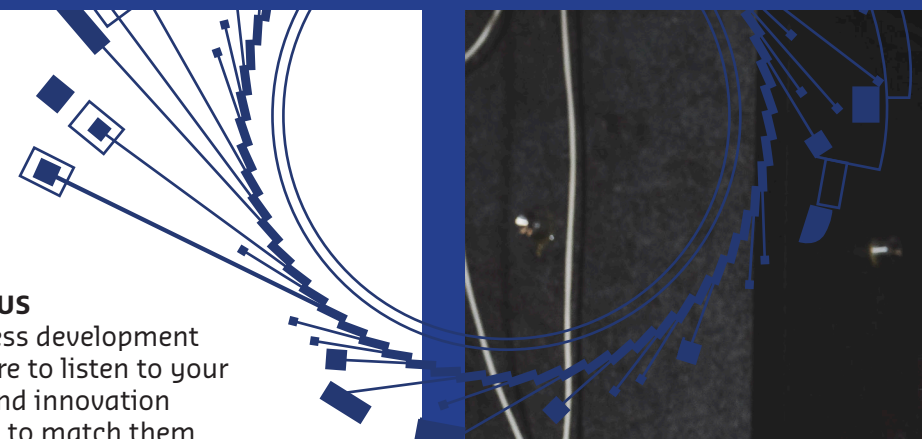
Piotr Goryl, founder and CTO, S2Innovation

THE IMPACT

“I was working with Tango at the Solaris synchrotron in Krakow when I first realised how effective it could be for industry. Although industry already has some of its own solutions, Tango is open-source, which means clients can have it modified as they wish to suit their needs. Although we are a private company, there is still a collaborative spirit when we work on Tango with the ESRF and the other scientific facilities that have developed it in the past. And that collaboration means that industry stands to gain from the cutting-edge developments in the scientific world, such as ultra-fast and scalable data acquisition. The industry we are in talks with told us they could find no other solution on the market.”
PIOTR GORYL, FOUNDER AND CTO, S2INNOVATION •

KEY FACTS

- Tango Controls is a free, open-source, device-oriented controls toolkit for controlling any kind of hardware or software and building supervisory control and data acquisition systems.
- For more information, please visit www.tango-controls.org



CONTACT US

Our business development team is here to listen to your research and innovation needs, and to match them with the facilities available at the ESRF and the services we offer, or to create customised collaborations and partnerships.

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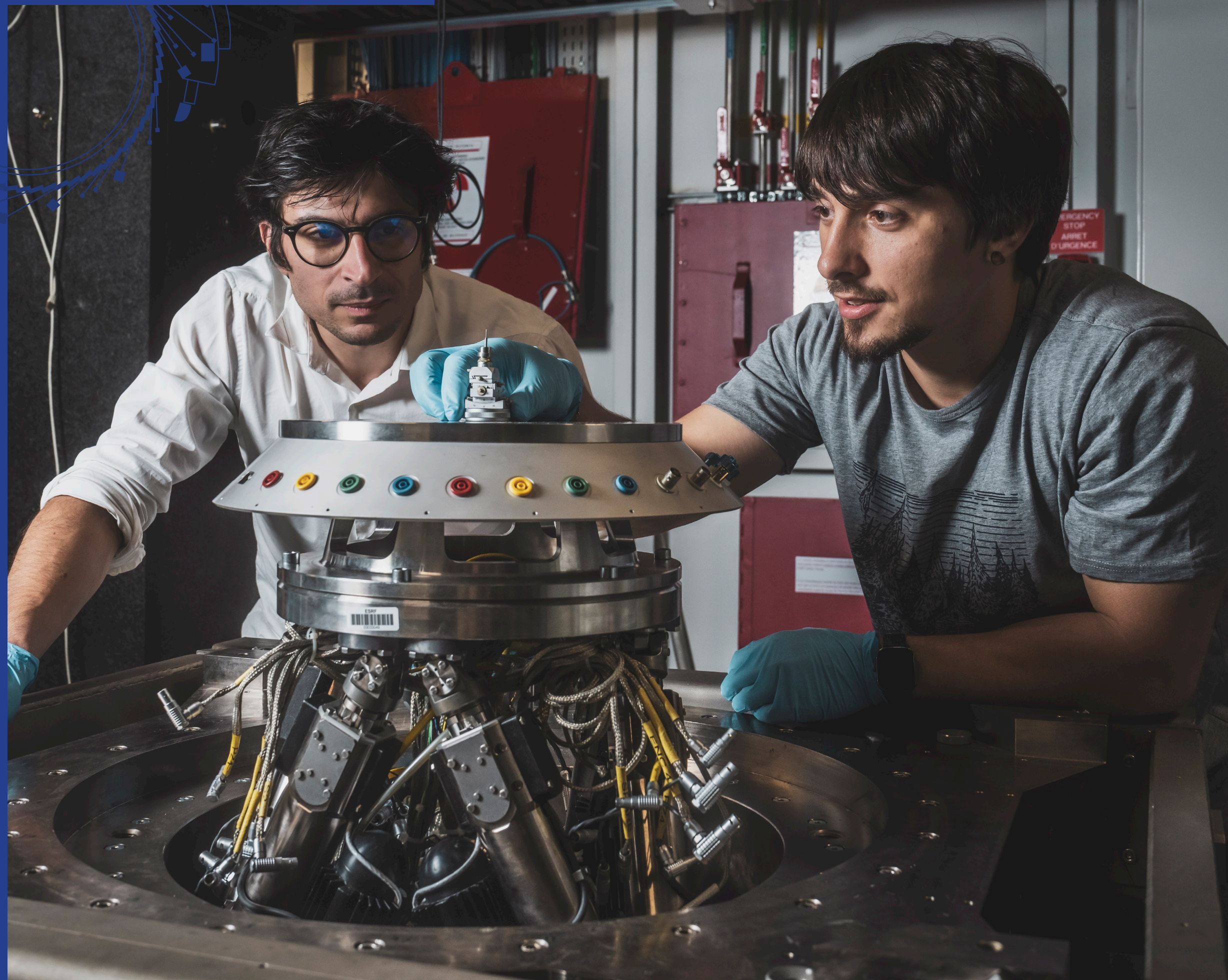
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