

# THE MONTHLY LIST

APRIL 2019



## LIST SUPPORTS ANISOPRINT IN IMPROVING 3D PRINTING TECHNOLOGY

**LIST and Anisoprint have committed to developing effective and tailor-made formulations of Carbon-Fibre Reinforced Polymer (CFRP) composites for industrial applications of 3D printed materials.**

On 13 March 2019, LIST and Anisoprint, a Russian start-up specialized in 3D printing technologies, having recently set up operations in Luxembourg, signed a three-year collaboration agreement. The two partners took the opportunity of their respective presence in Paris, France, at the 2019 edition of JEC World, the leading International Composites Show, to seal their commitment.

As part of the “Structural composite material for 3D-Printing” (SAMIA-3D) research project partly funded by the Luxembourg National Research Fund, the two partners undertake to develop and validate, by February 2022, tailored material formulations of Carbon-Fibre Reinforced Polymer (CFRP) composites that meet the specific requirements for industrial applications. Anisoprint, which already sells its own patented continuous-fibre 3D printing technology, allowing the manufacturing of complex 3D structures, now intends to further improve its concept in terms of materials. Such a development will allow Anisoprint to achieve new structural part specifications for a wide range of valuable applications including aeronautics, drones, electric cars, transportation and sport applications. To achieve this goal, the Russian company will rely on the expertise of LIST researchers in the field of structural composite materials and their manufacturing. Together, they will develop effective formulations from the laboratory scale to the demonstration stage. The research work will focus on a better characterization and improvement of both the formability and adhesion of 3D printed filament properties. CFRP materials are of great interest to manufacturers thanks to their excellent mechanical and chemical performance and recycling and potential lightweight structure capabilities. The focus of the collaboration between LIST and Anisoprint is to push back the limits of printed materials.

Anisoprint’s 3D printing technology aims to replace traditional extractive manufacturing technologies by introducing lightweight and extremely strong composite materials at a competitive price. It will also compete with metal 3D printing technologies in certain applications, providing significant cost savings due to lower equipment and material costs. Over the past year, the 3D printing sector has been constantly growing, creating in parallel a wide range of new opportunities and applications, mainly industrial. The development and progressive inundation of industrial production with 3D printing is evident in all sectors. The Anisoprint technology will not only make it possible to print parts made from continuous fibre-reinforced composite materials, but will also allow the successful combination of both polymer matrices and different fibres.

Photo from left to right: Damien Lenoble (LIST) and Fedor Antonov (Anisoprint)

# OTHER HIGHLIGHTS



## Research infrastructure

### STATE-OF-THE-ART FACILITIES FOR BIOTECHNOLOGIES RESEARCH

At its Hautcharage site, LIST has recently inaugurated new laboratories dedicated to bioreactors. LIST researchers in the field of environmental and industrial biotechnologies, as well as LIST research partners, will benefit from these state-of-the-art facilities in a six-metre high hall. These new laboratories are an integral part of the development of LIST's Greentech Innovation Centre and will also support Luxembourg's desire to build a greener economy. As Lucien Hoffmann, Director of the ERIN Department, explains: "We now have some unique equipment in the region that will enable us to generate new innovative synergies with industry". [Learn more at www.list.lu](http://www.list.lu)

## Luxembourg

### LIST: POSITIVE OUTLOOK AFTER SCRUTINY FROM PEERS

On 6 March 2019, during a press conference in the presence of international experts-evaluators, the Minister of Higher Education and Research, Claude Meisch, presented the results of the external evaluation of the public research centres (CRP). More than 35 international experts were involved in evaluating the different areas and activities of the CRPs according to the principle of peer review. In particular, for LIST, the decision to merge the CRPs Gabriel Lippmann and Henri Tudor to form LIST was welcomed by the evaluators. They identified high development potential through the establishment of a thematic strategy and internationalization, as well as the intensification of synergies and cooperation between LIST's research departments. [Learn more at www.list.lu](http://www.list.lu)



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## Scientific excellence

### STRAIN AS A LEVER TO ENHANCE FUTURE FERROELECTRIC PHOTOVOLTAICS

LIST researchers specialized in ferroic materials for transducers Shankari Nadupalli and Torsten Granzow, as well as Prof. Jens Kreisel – now vice-rector of the University of Luxembourg, recently wrote a paper entitled "Increasing bulk photovoltaic current by strain tuning", published in the scientific journal Science Advances, detailing the first-ever description of a new physical effect. The results are of great interest and could further increase interest in the new generation of photovoltaic materials based on ferroelectrics. In the coming years, researchers hope to create a significant efficiency increase in multi-junction systems, combining ferroelectric photovoltaics with conventional techniques. To reach this goal, LIST and its partners are working on a new FNR-funded project "Photovoltaics: Advanced Concepts for High Efficiency" (PACE), intending to develop a ferroelectrics-based photovoltaic cell as a wide-bandgap top cell for a multi-junction solar cell, using the newly discovered piezo-photovoltaic effect to increase its efficiency. [Learn more at www.list.lu](http://www.list.lu)

## Event

### TOWARDS A SMART NATION WITH THE INTERNATIONAL SYMPOSIUM

On 5-6 March 2019, the 10<sup>th</sup> International Symposium on Smart Cities, jointly organized by LIST and the Luxembourg Institute of Socio-Economic Research (LISER) took place at the Belval Innovation Campus. More than 200 participants took part in this year's conference, with the theme "Perspectives on the transformation of management and public organizations". As LIST CEO Thomas Kallstenius stated: "I think we should have a Smart nation strategy. We can be smart, in the context that we can bring the entire country in the kind of a digitalized form, and this can be a playground, a test market for digital services and innovation. This is something that would be pretty unique, I don't think it exists elsewhere". [Learn more at www.list.lu](http://www.list.lu)



## WHERE TOMORROW BEGINS

Located at the heart of Belval's Research & Innovation Campus, LIST can easily connect its 600-plus specialists in materials, environment and IT, including its many PhD students, through a broad range of joint research projects, programmes and partnerships with virtually all of Luxembourg's other major research players. At Belval, the University of Luxembourg, LIH, LISER, Technoport, Luxinnovation and the Luxembourg National Research Fund are all within arm's reach.

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