NATIONAL PRESS RELEASE – PARIS – 7 DECEMBER 2023

Michelin, the CNRS and l'Université Clermont Auvergne join forces to understand the science of tyre wear particles

- Michelin, the CNRS and l'Université Clermont Auvergne have combined their expertise as part of the new BioDLab joint research laboratory.
- The laboratory will focus on the degradation and biodegradation of tyre rubber.
- The ultimate goal is to make the wear particles resulting from contact between the road and the tyre bio-assimilable.

Michelin, the CNRS and l'Université Clermont Auvergne (UCA) inaugurated, on Wednesday, 6 December, the joint research laboratory BioDLab, dedicated to studying the degradation and biodegradation of tyre rubber. Its objectives are to better understand the tyre degradation process stemming from their use, as well as to develop technological solutions for the environmental issues associated with the wear particles that result from contact between road and tyre.

With a duration of 4 years, the joint research laboratory has the mission to develop tools for identification of practical solutions to make wear particles bio-assimilable by the environment.

To ensure driver safety, tyres must first and foremost stick to the road, which leads to erosion and generates wear particles. These particles form a complex mixture for which numerous chemical phenomena remain to be discovered, especially regarding their evolution over time when exposed to sun and water.

At the interface of materials science, chemistry, and microbiology, this new collaboration between the CNRS, Michelin, and UCA seeks to develop methods to assess elastomer degradation, an essential component of tyres, also producing a detailed analysis that sheds light on the mechanisms at work.

More specifically, the research will focus on the coupling between the degradation of diene elastomers or tyre rubber— via a photo- and/or thermochemical process — and their biodegradation either by microorganisms (isolated or in consortium) or by overexpressed enzymes[1]. Assessment methods for the various degradation processes will be developed, and a detailed analysis will provide a better grasp of the physicochemical reactions at play.
This collaboration will involve twenty members of the Institute of Chemistry of Clermont-Ferrand (UCA / CNRS), and ten employees from Michelin's Research and Development Department.

"*The CNRS is thrilled about the creation of this new associated research laboratory with Michelin, which offers a structured and lasting framework for jointly exploring the environmental impact of tyres, a challenge in common. Michelin is a primary industrial partner of our organisation, now with 9 active associated research structures, in addition to numerous research collaborations in connection with shared scientific issues,"* indicates Jean-Luc Moullet, the CNRS Chief Innovation Officer.
The CNRS encourages the creation of associated research laboratories with enterprises in an effort to advance research and tackle societal challenges at their side. The organisation has over 260 active associated research laboratories.

"*We are very happy to collaborate once again with the CNRS and l'Université Clermont Auvergne on an ambitious new field of research. This laboratory on wear particles illustrates our group's strong commitment.*
Considering the environmental impact of its activities is an integral part of Michelin's strategy. For a number of years, our group has worked to reduce the phenomenon of tyre abrasion, notably through knowledge of the materials but also a design strategy that has historically been oriented toward optimising material use. This policy enabled us to reduce the wear emissions for our tyres by 5% between 2015 and 2020.
Michelin is internationally recognized as a leader in the field of longevity, which was recently confirmed by a test conducted by the General German Automobile Club (ADAC)[2] involving one hundred different tyres (study published in March 2022). Finally, the Group has always been favourable toward establishing regulatory abrasion levels for tyres in order to limit wear particle emissions worldwide. As such, it has actively supported the recommendations of the European Commission (Euro 7 standard)", points out Eric-Philippe Vinesse, the Director of Research and Development, and a member of the Executive Committee.

"*BioDlab is the third associated research laboratory created between Michelin and l'Université Clermont Auvergne, and the second involving the Institute of Chemistry of Clermont Ferrand (ICCF). L'Université Clermont Auvergne is very pleased with this new partnership tool, which grew out of an ambitious collaboration policy between our laboratories and the business world, Michelin in particular. This scientific partnership will provide support for producing innovative and sustainable materials, and is therefore wholly in keeping with our scientific strategy, which aims to 'design sustainable models for living and for production'."* Mathias Bernard, President of UCA.

Notes

[1] These enzymes are notably provided by the CEA-Jacob department of Genoscope.
[2] Consult the study : TO31940 eng. alte Version (adac.de)

About the CNRS
The French National Center for Scientific Research is one of the most recognised and renowned public research institutions in the world. For more than 80 years, it has continued to attract talent at the highest level and to nurture multi-disciplinary and interdisciplinary research projects at the national, European and international levels. Geared towards the public interest, it contributes to the scientific, economic, social and cultural progress of France. The CNRS is above all 33,000 women and men, more than 1,000 laboratories in partnership with universities and other higher education institutions bringing together more than 120,000 employees and 200 professions that advance knowledge by exploring the living world, matter, the Universe, and the functioning of human societies. The CNRS ensures that this mission is carried out in compliance with ethical rules and with a commitment to professional equality. The close relationship it establishes between its research missions and the transfer of acquired knowledge to the public makes it today a key player in innovation in France and around the world. Partnerships with companies are at the heart of its technology transfer policy, and the start-ups that have emerged from CNRS laboratories bear witness to the economic potential of its research. The CNRS provides also access to research findings and data, and this sharing of knowledge targets many audiences: scientific communities, the media, decision-makers, economic players and the general public. For more information. (www.cnrs.fr)

About Michelin
Michelin's ambition is to sustainably improve its customers' mobility. The leader in the mobility sector, Michelin designs, manufactures, and distributes the tires best suited to their requirements and uses as well as services and solutions to improve transport efficacy. Michelin also puts forward offers that allow its customers to enjoy unique moments when traveling. Michelin also develops high-technology equipment intended for multiple fields. Based in Clermont-Ferrand, Michelin is present in 175 countries, employs 132,200 people and operates 67 tire factories that, together, produced approximately 167 million tires in 2022. (www.michelin.com).

About UCA
L'Université Clermont Auvergne is home to 36,000 students, and employs 3,300 staff members. It received the Initiatives – Science - Innovation - Territoires - Economie (I-SITE) label from the French National Research Agency (ANR), and is among the 17 French Universités d'excellence. This recognition is in connection with the CAP 20-25 project, which mobilises the institution's structures and partners around the scientific topic of "conceiving sustainable living and production models." UCA pursues a voluntaristic policy that brings its 47 research structures closer to the broader socioeconomic world. It is one of the establishments supported by the Ministry for Higher Education, Research, and Innovation in connection with a university innovation centre focusing on five topics: food and sustainable agronomy; mobility, cities, and sustainable industrial production; sustainable and recycled materials, sustainable fuels; mobility and health; and innovation for managing mass data. The objective is to increase the economic impact of local research by stimulating public-private partnerships and the creation of start-ups. (www.uca.fr)

Contacts

CNRS Press | Manon Landurant | **T +33 1 44 96 51 37** | manon.landurant@cnrs.fr

UCA Press | Stéphanie Lamaison | **T +33 6 59 68 92 26** | communication@uca.fr

Michelin Press | Florence Marchand | **T +33 1 45 66 22 22** | florence.marchand@michelin.com