PhD positions on sustainable photopolymer composites

Two PhD positions are available at the EPFL's Laboratory for Processing of Advanced Composites (LPAC) to develop sustainable, biobased and photopolymerized materials and processes, within the European MSCA Doctoral Network ESPERANTO, starting in February 2023. The two PhDs are scheduled to start in the Fall 2023.

Located in Lausanne on the shores of Lake Geneva, EPFL is one of Europe's most famous science and technology institutions and the most cosmopolitan one. The main research activities of LPAC are to establish the scientific base for the next generation of materials and processes in the fast-growing fields of polymers and composites. This involves novel approaches to tailoring material systems and process cycles, development of new materials with controlled rheology, solidification kinetics and surface characteristics, process simulation and costing, and quantitative durability analysis for optimal life cycle strategies.

ESPERANTO (Enhancing the Sustainability of PhotopolymERs ANd phoToinduced prOcesses) aims at i) improving the sustainability of photopolymers ii) boosting the use of photopolymerisation processes in the industrial sector to replace less sustainable processes iii) training a new generation of researchers with advanced scientific skills and sustainability consciousness. Gathering 8 universities and 8 non-academic partners, ESPERANTO will reach its objectives through individual PhD projects addressing sustainable innovation, within an international and intersectoral research network of academic institutions and enterprises in the field of photopolymers and high-tech. The objectives and activities of the two PhDs available at the LPAC are as follows.

PhD1 will i) develop bioinspired, cellulose-based composite coatings using self-assembly and UV printing processes, ii) characterize the surface and mechanical properties of the coatings, in particular their self-cleaning ability and abrasion resistance, and iii) assess the life-cycle performance of the produced materials, in collaboration with ESPERANTO partners.

PhD2 will i) develop biobased, light-responsive foams using photoreversible precursors with focus on liquid impregnation and curing processes, ii) study the light absorption and chemical conversion in the multiphase foam/air/photoreactive media and characterize the cured foams and evaluate their degree of photoreversibility and iii) develop photoresponsive prototypes and assess their life-cycle performance, in collaboration with ESPERANTO partners.

The selected candidates have a very solid background in materials science and organic chemistry. Abilities in designing delicate experiments and mastering fine analytical techniques will be very useful. Mastering of the English language is also required. According to the MSCA rules, the candidates can be of any nationality and they must not have resided or carried out their main activity (work, studies, etc.) in Switzerland for more than 12 months in the 36 months immediately before their recruitment date. In conjunction to the application the candidate should apply to the materials science and engineering doctoral school (https://www.epfl.ch/education/phd/edmx-materials-science-and-engineering/)

Applications including a CV, a motivation letter and the names and contact details of three reference persons should be directed to (applications with missing information will not be considered):

Dr. Yves Leterrier
Laboratory for Processing of Advanced Composites (LPAC)
Ecole Polytechnique Fédérale de Lausanne (EPFL)
Station 12, CH-1015 Lausanne, Switzerland
yves.aterrier@epfl.ch
lpac.epfl.ch