

proposition de thèse projet Re-fibre

Fiche à remplir de préférence en anglais et à envoyer à euraxess@univ-fcomte.fr

1/ Intitulé du poste : PhD thesis offer: Experimental and numerical study of the interphase properties of bio-fibre/lignin-epoxy composites using a micromechanical approach

2/ Résumé du poste : (1000 caractères MAXI espaces inclus)

This thesis is conducted within the framework of Re-Fibre, a European project funded by the Marie Skłodowska-Curie Actions Doctoral Network (MSCA-DN). Re-Fibre aims to revolutionize the bio-fibre composite landscape by developing high-performance, fully renewable, and recyclable wood and plant fibre materials. The research focuses on the experimental and numerical investigation of interphase properties in bio-fibre/lignin-epoxy composites using a micromechanical approach.

3/ Description du poste : (3000 caractères MAXI espaces inclus)

RE-Fibre is a Doctoral Network funded by Marie Skłodowska-Curie Actions (MSCA-DN) that aims to revolutionize Bio-fibre composite landscape by designing high-performance, fully renewable, and recyclable wood and plant fibre materials. **RE-Fibre will train 11 Doctoral** Candidates (DCs) with an entrepreneurial and sustainability-mindset in the disciplines of green/lignin chemistry, new biobased materials, and environmental systems science.

The DCs will build on ground-breaking findings being generated at the RE-Fibre consortium, to enable the development of fully recyclable functional biobased composites with properties on par with fossil-based counterparts. They will gain competencies, not only in a breakthrough scientific field but also in interdisciplinary and interpersonal skills. Additionally, they will expand their network and gain experience through participating in secondments (research stays at a site of an academic or industrial partner). Finally, DCs will learn the best practices by developing online research and training tools, enabling them to work and collaborate across academic and industrial sectors. RE-Fibre training will contribute to DCs employability as future leaders, while supporting the green transition and a sustainable circular economy in Europe.

DC8

Project title: Experimental and numerical study of the interphase properties of bio- fibre/lignin-epoxy composites using a micromechanical approach

Main supervisor: Dr. Vincent PLACET (UMLP), **Co-Supervisor:** Dr. Florian Boutenel

Co-Tutor: Peter DEUSS (RUG)

Industrial Supervisor: Marion FREY (BComp)

Project:

The main ambition of this project is to develop high strength, lightweight, fully bio-based and recyclable composites using recyclable lignin-derived epoxies and polyurethanes and plant fibre reinforcements (flax and hemp). To reach the requirements for the industrial application of composites, it is necessary to better understand the interaction of epoxy resins with plant fibres and the physicochemical phenomena that take place in the interface region during plant fibre impregnation and epoxy curing.

Objectives:

- (1) Characterise the interface region between bio-fibre and lignin based epoxy resin and map the nonuniform mechanical properties in the interphase material
- (2) Shed light on the physicochemical phenomena that take place in the interface region during plant fibre impregnation and epoxy curing
- (3) Evaluate the influence of non-uniform mechanical using micromechanical models and numerical simulation

Secondments:

- 1) **ETHZ (4 months)** application of developed characterization methods on wood-based composites (Pr. Ingo Burgert)
- 2) **BComp (6 months)** investigate and understand requirements for fibre-applications (Dr. Marion Frey)

4/ Profil du candidat : « first stage researcher » / “recognize researcher” / “established researcher” / “leading researcher” (plusieurs choix possibles)

First stage reseracher

5/ Champs de recherche principal /principaux : (cf annexe p.3 « thématiques »)

Engineering

6/ Champs de recherche secondaire(s) = détail sur le champ principal si besoin

7/ Type de contrat : - CDD /CDI / a definir /autre

- Temps plein /temps partiel/négociable/autre

Temporary, Full time

8/ Nombre d’heures par semaine : 35

9/ Date de clôture de l’offre : 28 February 2025 – 17:00 CET

10/ Date de début du contrat : June 2025

11/ L’offre s’inscrit-elle dans un programme cadre de recherché de l’Union Européenne? Oui/non

SI OUI : référence du programme

Horizon Europe MSCA - DN

+Si MarieCurie : grant agreement number

Marie Curie Grant Agreement Number: 101168684

12/ Précisions :

- Si le lieu de travail est dans un autre pays, le préciser.
- Le poste est ouvert aux réfugiés (Science4Refugees)?
- L'emploi est-il lié à un poste au sein d'une infrastructure de recherche ?

13/Comment candidater ? au choix : Via un site web/ par mail

Si l'offre demande un formulaire à remplir, le joindre

<https://refibre-dn.eu/>

14/Adresse de l'employeur :

Site web :

Email &téléphone de la personne que les candidats peuvent contacter pour des détails :

15/ Adresse du lieu de travail : données de géolocalisation (latitude et longitude) - Plusieurs adresses possibles

16/ Diplôme(s) requis:

Master's degree in Mechanical Engineering, Materials Science, Advanced Composites, Bio-based Materials, Wood Sciences

17/ Compétences : (il est possible de rajouter un texte sur la qualification et les compétences attendues)

Mechanical engineering, Materials Science, Polymer chemistry

18/ Savoir-faire spécifiques :

19/ Langues et niveaux requis : (basic, bon, excellent, langue maternelle)

English (excellent)

20/ expérience de X années dans requise : (aucune/ 1 à 4 ans/ 4 à 10 ans/ plus de 10 ans) sur la thématique Y (cf annexe « thématiques »)

21/ Nombre de postes offerts

22/ Site web pour plus de détails sur l'offre : <https://refibre-dn.eu/>

23/ Avantages : salaires, congés, primes etc...

Marie Sklodowska-Curie DCs are paid a competitive gross Living Allowance of 3,400 €/month, **adjusted for their host country**, a Mobility Allowance of 600 €/month and, for researchers who have a family, a Family Allowance of 660 €/month. All amounts are subject to deductions and taxes. Family is defined as persons linked to the researcher by (i) marriage, or (ii) a relationship with equivalent status to a marriage recognised by the national legislation of the country of the beneficiary or of nationality of the researcher, or (iii) dependent children who are actually being maintained by the researcher.

24/ Critères d'éligibilité :

There are strict eligibility requirements for the DC positions in MSCA-Doctoral Networks (DNs). Please ensure to be qualified before applying, as ineligible candidates cannot be considered.

- Admission to the program is open to applicants who hold a 2nd Level Master Degree (120 ECTS + 180 ECTS in a bachelor degree) or a Single Cycle Degree (minimum 300 ECTS), or a comparable university degree (Second Cycle qualification), as required by the partner universities for admission to doctoral studies.
- At the time of recruitment applicants must not have been awarded a doctorate.
- At the time of recruitment applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organization for more than 12 months in the 3 years immediately before their recruitment date. Compulsory national service and/or short stays such as holidays and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.
- Applicant must be able to communicate **fluently in English** (at least B2-level speaking and writing).

The Supervisory Board will pay special attention to respect gender balance.

RE-Fibre will adopt the principles of the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers promoting open, merit-based and transparent recruitment and attractive working and employment conditions.

The two-step procedure for applicants' selection is based on assessment of the documents attached to the application form and on an interview (videoconference) to those applicants who have passed the first-step selection. Shortlisted applicants will be informed of the interview process within three weeks from the deadline for applications.

25/ Commentaires :

Applicants can apply for up to **3 PhD projects**, indicating the order of preference. All applications will have to be written in English and will be checked for eligibility. Ineligible or incomplete applications will not be considered. **Applications must be submitted through the RE-Fibre website** (<https://refibre-dn.eu/>) from **01.02.2025 at 17:00 Central European Time** to **28.02.2025 at 17:00 Central European Time**. Applications coming through different channels than the project website (e.g. sent by email) will not be considered.

Applicants are required to fill in the **Application form** on the website and submit the following documents by **uploading them as PDF files**:

- Detailed *Curriculum Vitae* ([Europass format](#) – with added List of publications, participation in funded research projects, other qualifications, if any, must be included)
- Certified copy of Academic Degree/s in original language along with a certified translation into English, and/or Diploma Supplement (if applicable)
- Certified copies of official Academic Transcripts relating to all academic courses taken to earn every degree (bachelor/master or equivalent), translated into English, and corresponding grade point average
- Copy of passport (or, for EU citizens, equivalent ID document)

Additionally, to complete your application, please send the filled **Mobility Rule** template to applications@refibre-dn.eu. Finally, **two recommendation letters** (prepared using a template) must be sent directly by the referees to applications@refibre-dn.eu, with the name of the applicant in the subject line until the application deadline. **Recommendation letter template** and **Mobility Rule template** can be downloaded on the confirmation page **after submitting the application** form and are included in the conformation mail.

Failure to submit any of the above documents or lack of any of the required reference letters implies exclusion from the RE-Fibre recruitment procedure. For more information, please contact us through the Contact form on the RE-Fibre website. Data of the applicants will be shared within the Consortium for recruitment purposes only. All data provided by the applicants are processed solely for the purpose of the RE-Fibre call for applicants.

The **application deadline** may be extended if not enough applications are received. Information about a possible extension will be published on the project website and other communication channels.