



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 860911

## ESR-9 JOB VACANCY

### Position description

Reference:	<b>ESR-9</b>		
Title:	Highly ordered nacre-inspired vitrimer nanocomposites with light-adaptive properties		
Hiring beneficiary:	<b>ALU-FR</b>		
Location:	University of Freiburg, Germany		
Start date:	01 October 2020	Duration:	36 months
Expected date of communication of results:	Less than 2 months after the application submission		

### Job description

Objective:	The project aims at the development of bioinspired vitrimer nanocomposites embedding highly ordered 2D nanoclays in different vitrimer matrices to afford nacre-mimics with lamellar structures at high fractions of reinforcement (> 50 wt%) upon evaporative self-assembly. The candidate will design and synthesize different vitrimer materials with a focus on different vitrimer exchange reactions using polymer chemistry tools, and study in detail their mechanical behaviour. By embedding photo-responsive elements we aim for an understanding how such materials can be made light-switchable. Areas of application are adaptive mechanical materials and switchable adhesives that will be investigated for their applicability for windscreen applications in the automotive industry.
Expected results:	The candidate will develop vitrimer-based nacre-inspired nanocomposites with broad structural variety that can be crosslinked on demand after casting. On a nanocomposite level, understanding of the mechanical property space of artificial vitrimer nacre dependent on type, amount and temperature response of molecular exchange reaction. He/She will understand how molecular energy dissipation mechanisms (bond exchange dynamics) need to be tuned in nanoconfinement to allow for synergistic mechanical properties. He/She will also develop light-responsive vitrimer nanocomposites and study their switchable mechanical and adhesion properties. These new materials will be applied as repositionable adhesives suitable for the automotive industry (i.e. any component attached to the windscreen such as mirror buttons or sensors) that can be debonded-on-demand after localized heating.
Supervisor:	Prof. A. Walther
Secondments (short term academic and industrial internships):	S1 to <b>Polymat</b> (San Sebastian, Spain) – 3 months – develop vitrimer nacre-mimics using PHU-based vitrimer matrices involving transcarbamylation or disulfide metathesis exchanges. S2 to <b>Oribay</b> (San Sebastian, Spain) – 3 months – apply NIR-responsive PHU-based vitrimer nanocomposites as ultrastiff/tough repositionable adhesives for automotive windscreen applications.

Vacancy requirements	
Qualifications:	<p>Not having resided in Germany for more than <b>12 months in the 3 years</b> immediately before the recruitment date, and <b>not have carried out their main activity</b> (work, studies, etc.) in Germany.</p> <p>Having a master degree or equivalent diploma, less than 4 years of research career at the recruitment date, and not having a doctoral degree M.Sc. or related in Chemistry with a solid background in polymer or organic chemistry.</p>
Languages:	<p>Excellent level in oral and written English is mandatory.</p> <p>German language is optional.</p>
Skills:	<p>Strong research skills with an independent self-motivated attitude, ability for project management, dissemination, communication with colleagues and supervisors and strong teamwork spirit.</p>

Job details	
Gross salary:	<p>Salary and benefits will be in compliance with the rules of the ITN-MSCA, as foreseen in the Marie Skłodowska-Curie Actions Work Programme.</p> <p>Total remuneration costs (including salaries, social security contributions, taxes and other costs included in the remuneration) per month: 3 171,90 €</p> <p><u>Gross salary: 2645 € per month + 415 € mobility allowance</u> (estimated net salary <u>before income tax</u>: 2140 €/ month + 336 € mobility allowance)</p>
Other benefits:	<p><u>Gross family allowance: 350 € per month - if applicable at the time of recruitment</u> (estimated net family allowance before income tax: 280 €/month)</p> <p>Family allowance: 'Family' means persons linked to the researcher by marriage (or a relationship with equivalent status to a marriage recognised by the legislation of the country where this relationship was formalised) or dependent children who are actually being maintained by the researcher.</p>
Duration:	36 months
Starting date:	Ideally ca. the 01/10/2020
Type of contract:	Full time position
Hours per week	39 hours
Place of work:	<p>Institute for Macromolecular Chemistry Stefan Meier Str. 31 79104 Freiburg, Germany <a href="http://www.walther-group.com">www.walther-group.com</a></p>
Local language:	German

Application package is available on the Recruitment page of the VITRIMAT website  
<https://www.vitrimat.eu/Recruitment.html>