

## Position Description

### Group of research topics: Architected materials

<b>Position is funded by</b>	<ul style="list-style-type: none"> <li>- COFUND, Marie Skłodowska-Curie Actions (MSCA), Horizon 2020, European Union</li> <li>- Conservatoire National des Arts et Métiers (CNAM), France</li> <li>- RMIT University (RMIT), Australia</li> </ul>
<b>Research Host</b>	Conservatoire National des Arts et Métiers, France
<b>PhD awarding institution</b>	Dual PhD awarded by Hautes Écoles Sorbonne Arts et Métiers University (HESAM University) and RMIT University (RMIT)
<b>Locations</b>	<ul style="list-style-type: none"> <li>- Primary: Paris, France</li> <li>- Secondary: Melbourne, Australia</li> <li>- Annual workshops in Barcelona, Spain</li> </ul>
<b>Contract</b>	Full-time, fixed term (36 months, extensible to 48)
<b>Gross annual salary</b>	28800 EUR per year approx. (gross amount before employee's taxes and contributions)
<b>Preferred start date</b>	01/01/2023 (tentative)
<b>Deadline for applications</b>	19/09/2022 (Reference: CNAM-DC2)

### Your choice of research topics (only one of these projects will be funded):

Project 1: Multiphysics Modelling of Bioinspired Materials	Project 2: Laser-Architected Light Alloys for Aerospace Applications	Project 3: Temperature-Responsive Multipolymer Interlocking Materials
<p>This project will be focused on the understanding of mechanically coupled physical phenomena in biological materials and the design through bioinspiration of architected materials exploiting such coupling between physics for engineering applications. While being mainly concerned by the computational implementation of multiphysics models and the determination of effective properties through homogenization, we will also develop convincing experiments to quantify the mechanical performance of the architected materials of interest in this project.</p>	<p>This project will focus on the modelling, design, &amp; processing of architected materials made of light alloys suitable for structural applications in aerospace and space launchers. It will include experimentally quantifying the applicability of localized laser heat treatment to light alloys such as Aluminium and Titanium based alloys, characterizing their microstructures, as well as testing of their mechanical properties. Finally computational models will be developed as guiding tools for the design of future aerospace structural components.</p>	<p>This project will develop new classes of architected hybrid materials with improved mechanical and physical properties, notably impact strength and acoustic damping. They are based on the design and production of complex, topologically-interlocking shapes and multi-material structures using recent advances in 3D polymer printing. These ensembles are also designed to be held together by shape memory alloys and polymers, which can be stimulated to change their properties – and therefore those of the ensemble - by the application of heat. These materials target applications in protective wear, as well as noise and vibration abatement.</p>
<p><b>Supervisors:</b>            Dr. Justin Dirrenberger (CNAM) and Dr. Andrey Molotnikov (RMIT)</p>		



**Research Fields:** Modelling, solid mechanics, bioinspiration, additive manufacturing

**Research Fields:** Laser manufacturing, physical metallurgy, solids mechanics

**Research Fields:** Additive manufacturing, solid mechanics, composite materials

For more information on the Projects, contact us: [redi.help@rmit.edu.au](mailto:redi.help@rmit.edu.au)

## Are you REDI? (Expected Profile)

**Your background and skills:** You have obtained a higher education degree in the field of materials science, engineering science or any other relevant field. You are self-motivated, autonomous, scientifically rigorous, and show some interest towards the topic of architected materials.

**Your work experience:** You have prior work experience within a research laboratory, either academic or industrial.

**Your research experience:** You have successfully performed academic research during your Master's degree, including bibliographical work, implementation of models, coding/scripting, conducting experimental campaigns, analysing and interpreting the results, writing up articles and reports.

For more information about the general conditions of the REDI Program and the Eligibility Criteria, please visit: <https://www.rediprogram.eu/>

## Employment Benefits and Conditions

CNAM offers a 36-month position, extendable up to 48 months in duly justified cases. The position will be based in Paris (France). International travel is foreseen, including to Australia (up to 12 months) and Spain (one week per year). There is no probation period and there are 35 working hours per week.

The remuneration, in line with the European Commission rules for Marie Skłodowska-Curie grant holders, will consist of a gross annual salary of est. 28800 EUR gross per year (gross amount before employee's taxes and contributions). Of this amount, the estimated net salary to be perceived by the Researcher is est. 2.100 EUR net per month\*. However, the definite amount to be received by the Researcher is subject to national tax legislation.

*\*Net salaries can fluctuate in accordance with an individual's personal circumstances (marital status, age, disability, family and dependents, etc. The above indicative net salaries offer an approximation of what a single person in their early 20s could expect to receive in their bank account after taxes.*

### Benefits include:

- 50% public transport subscription
- 1,000€ yearly travel allowance to cover flights and accommodation to participate in the annual workshop at RMIT Europe in Barcelona (Spain)
- 10,000€ allowance to cover flights and living expenses for up to 12 months in Australia

Learn more on [RMIT](#), [CNAM](#), and [HESAM](#) on our website:  
<http://www.rediprogram.eu/about/#hostinstitutions>



**PhD enrolment. Successful candidates for this position will be enrolled by the following institutions:**

## CNAM

### Admission

As part of the admission process to CNAM, you will need to meet the following requirements:

- Copy of a valid photo ID (ID, Passport, etc.)
- Degree certificate and transcript of records of a Master's Degree (or equivalent). If the diploma is in a foreign language, a translation of the diploma into French by a sworn translator needs to be attached. Likewise, if the diploma is outside the EU, CNAM will proceed to an examination of the application by external reviewers.
- Official English test (TOEIC, IELTS, TOEFL, etc.) with a minimum score to reach level B2 (or a declaration of honour indicating the commitment to take a test within the year).
- Subscribe to Liability insurance

(More information: <https://recherche.cnam.fr/etudes-doctorales-hdr/s-inscrire-ou-se-reinscrire-en-doctorat-avec-adum-682790.kjsp>)

## RMIT

### Admission

If your application is successful, you will be enrolled as Doctoral Student at RMIT University for the entire duration of the assignment. At admission, you will need to supply:

- CV
- Complete transcripts for all academic qualifications
- Research proposal or statement of interest in an available research project
- Language certificates
- List of referees

More information: <https://www.rmit.edu.au/research/research-degrees/how-to-apply>

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