

Position Description

Group of research topics: Architected materials

Position is funded by	<ul style="list-style-type: none"> - COFUND, Marie Skłodowska-Curie Actions (MSCA), Horizon 2020, European Union - Conservatoire National des Arts et Métiers (CNAM), France - RMIT University (RMIT), Australia
Research Host	Conservatoire National des Arts et Métiers, France
PhD awarding institution	Dual PhD awarded by Hautes Écoles Sorbonne Arts et Métiers University (HESAM University) and RMIT University (RMIT)
Locations	<ul style="list-style-type: none"> - Primary: Paris, France - Secondary: Melbourne, Australia - Annual workshops in Barcelona, Spain
Contract	Full-time, fixed term (36 months, extensible to 48)
Gross annual salary	28800 EUR per year approx. (gross amount before employee's taxes and contributions)
Preferred start date	01/10/2022
Deadline for applications	30/04/2022 (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><i>Further information may be obtained from the Supervisors.</i></p>	<p>This project will focus on the modelling, design, & 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><i>Further information may be obtained from the Supervisors.</i></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><i>Further information may be obtained from the Supervisors.</i></p>



Supervisors:

Dr. Justin Dirrenberger (CNAM) and Dr. Andrey Molotnikov (RMIT)

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

Research Fields: Laser manufacturing, physical metallurgy, solids mechanics

Research Fields: Additive manufacturing, solid mechanics, composite materials

REDI

The REDI (RMIT European Doctoral Innovators) program is a unique opportunity offering excellent PhD conditions including enviable international experience, top-class research discipline and transversal skills training as well as networking with academic and industry leaders across 60+ supporting partners and 12 countries.

As a REDI researcher you will be:

- seeing the world and spending a year at RMIT University in Melbourne, Australia (ranked in the top 20 of universities under 50 years old in the world).
- part of a rich multidisciplinary network of researchers and supervisors who come together in annual, week-long training events in Barcelona.
- working closely with industry and gaining experience with the 40+ leading companies supporting the program.
- earning a salary above national standards for doctoral positions with full social security benefits (with further support available for eligible researchers with additional needs).
- receiving support and guidance from two highest-calibre, experienced supervisors with high PhD completion rates.
- enhancing your career prospects through comprehensive technical and transversal skills training from leading institutions, intersectoral and international experience and mentoring.
- working on innovative and exciting projects of high commercial and societal value with up to four years to complete your research.
- Gaining alumni status from your PhD awarding institution and the Marie Curie Alumni Association.

For more information visit: rediprogram.eu

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.

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

REDI to apply? First a little more about us...**CNAM**

The Conservatoire National des Arts et Métiers (CNAM) is where the worlds of academics and professional activity come together. It is the only higher education establishment in France dedicated to life-long professional training. CNAM has three main missions:

- lifelong higher professional training,
- technological research and innovation,
- dissemination of scientific and technical culture.

CNAM proposes training courses developed in close collaboration with companies and professional organizations in order to provide the optimum answer to their needs and to those of their employees. The Conservatoire steers 20 regional Centers and 180 training centers having their Head Office in Paris.

CNAM offers to the recruited Researcher a wide range of training and mentoring opportunities, including:

- **Courses and training opportunities:** training hours are required as part of the Doctoral program (professional and scientific).
- **Language courses:** CNAM offers two free language courses each year, some of which are intended for non-French speakers.
- **Cultural and social activities:** CNAM organizes an event called "J2A" (the doctoral days) for doctoral students registered in the second year. Likewise, regular laboratory seminars are offered during the year.

For more information, visit: <https://www.cnam.eu/site-en/>

HESAM University

CNAM is a founding member of HESAM Université, which is a federal university with the national status of public scientific, cultural and professional establishment (EPSCP) and has legal, administrative and financial autonomy in the French educational system.

HESAM Université is made up of 15 French and international higher education institutions forming educational, research and corporate networks and dedicated to the challenges of demographic, digital, technological and social transformation.

HESAM Université aims to create **a new kind of university**, based on interdisciplinarity and sharing of knowledge and skills developed by its members. Institutions have decided to partner with us in order to enhance their potential in their respective fields of excellence through inter-institutional cooperation.

The members of HESAM Université share the common goal of building a new interdisciplinary university of knowledge bringing together the various institutions' cultures and scientific approaches to educate an increasingly wide and diversified public.

This association has led to the creation of an interdisciplinary **Research Graduate School**, a natural step towards achieving this cooperation at the global level.

For more information, visit: <https://www.hesam.eu/>



RMIT University

RMIT is a global university of technology, design and enterprise, ranked in the top 20 of universities under 50 years old in the world. World-class people, leading edge resources, collaboration with industry partners and multi-disciplinary approaches are just a few of the trademarks of research at RMIT, which boasts almost 90,000 students and campuses in Australia, Vietnam, a centre in Barcelona, Spain and research and industry partners on every continent.

As Doctoral Student at RMIT you will be able to benefit from a wide range of training and mentoring opportunities including:

- **The PhD Up** program offering a huge range of workshops, seminars and short courses to build research knowledge and skills, including research writing, publishing, research methods, ethics, project management and careers (see more at: <https://www.rmit.edu.au/students/student-essentials/information-for/research-candidates/enriching-your-candidature/phd-up-program>)
- **RMIT PhD Online Modules**, designed specifically for PhD students, including *Researching your literature review*, *Writing a research proposal*, *Choosing where to publish*, *Writing for Publication*, *Research Integrity*, etc.
- **RMIT Creds**, RMIT's Digital Credentials Platform, which includes over 80 credentials covering a wide range of topics such as *Understanding Responsible Research and Innovation*, *Academic Integrity Awareness*, *Emotional Intelligence*, *Diversity Matters*, *Agile Ways of Working*, *Why Gender Matters*, *Cross Cultural Communications*, etc. (see more at: <https://www.rmit.edu.au/study-with-us/levels-of-study/short-courses>);
- **The e-Grad School**, the online learning modules of the Australian Technology Network (ATN) of Universities' covering a multitude of transferrable skills such as *Critical and Creative Thinking*, *Leadership and Communication*, *Entrepreneurship*, *Research Commercialisation*, *Public Policy*, etc.
- **The RMIT Mentoring platform** also gives you access to mentoring from trained professionals and experts, including:
 - o *Career Mentoring* - career guidance from industry professionals from all disciplines and global locations.
 - o *Women@RMIT Mentoring* - career guidance from industry professionals who are committed to gender diversity and equality in the workplace (especially for female students in male dominated industries)
 - o *Pride Mentoring* - a chance for students who identify as LGBTIQ+ to receive professional and social guidance from industry professionals who also identify as LGBTIQ+ or are familiar with the additional challenges these groups face in the workforce.

Find out more: rmit.edu.au

A little more about you...

Eligibility

You need to fulfil criteria of the REDI program and both universities to be recruited.

To apply for REDI, you must comply with the MSCA-COFUND eligibility criteria by the application deadline:

- **Be in the first four years Full-Time Equivalent (FTE) research experience** of your research career and not yet have been awarded a doctoral degree. FTE Research Experience is measured from the date when a researcher obtained the degree entitling him/her to embark on a doctorate, **AND**
- **Not have resided or carried out your main activity (work, studies, etc.)** in the country of your research host for more than 12 months in the 3 years immediately before this call's deadline. Time spent as part of a procedure for obtaining refugee status under the Geneva Convention (1951 Refugee Convention and 1967 Protocol), compulsory national service and/or short stays such as holidays is not taken into account.

AND the following criteria:

- **Hold a bachelor's degree requiring at least 4 years of full-time study** in a relevant discipline awarded with honours and including a research component; **OR**



- **Hold a master's degree that includes a research component** or a master degree without a research component with at least a high distinction average; **OR**
- **Have evidence of appropriate academic qualifications and/or professional experience** demonstrating that the applicant has developed knowledge of the field of study or cognate field and the potential for research sufficient to undertake the chosen project.

AND

- Have **English level C1 language proficiency**.

In addition to the above, if your application is successful, you will be required to:

- Apply for a student visa in Australia (More information: <https://www.rmit.edu.au/study-with-us/international-students/apply-to-rmit-international-students/student-visas/apply-for-a-visa>)

In addition to meeting the eligibility criteria for the REDI Program, you will also need to meet the admission criteria of both institutions:

Admission at CNAM

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>)

Admission at RMIT University

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>

Apply now (<https://www.rediprogram.eu>)

