

Position Description

Group of research topics: Additive Manufacturing

Position is funded by	<ul style="list-style-type: none"> - COFUND, Marie Skłodowska-Curie Actions (MSCA), Horizon 2020, European Union - Eurecat, Centre Tecnològic de Catalunya - RMIT University (RMIT), Australia
Research Host	Eurecat, centre Tecnològic de Catalunya
PhD awarding institution/s:	Dual PhD awarded by the Polytechnic University of Catalonia (UPC) and RMIT
Locations	<ul style="list-style-type: none"> - Primary: Manresa, Barcelona, Spain - Secondary: Melbourne, Australia - Annual workshops in Barcelona, Spain
Contract	Full time, fixed term (36 months) with the option to extend up to a maximum of 48 months
Gross annual salary	23.725 EUR
Preferred start date	01/09/2022
Deadline for applications	30/04/2022 (Reference: EUT-DC2)

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

Project 1: Understanding fatigue resistance of AM parts from processing parameters and material properties	Project 2: Fatigue assessment of structural parts produced by additive manufacturing	Project 3: High fatigue performance AM parts by topological optimization
<p>Additive manufacturing (AM) is rapidly penetrating the industry to produce high performance parts. Fatigue resistance is one of the key application properties in many engineering components. It is greatly influenced by the pre-existent defects, mainly their size and distribution. A proper understanding of the influence of defects produced during manufacturing is crucial to understand the fatigue resistance and to optimize manufacturing parameters to obtain high performance parts. The PhD focusses on the experimental evaluation of the interaction between microstructure, defects, and</p>	<p>Additive manufacturing (AM) is rapidly penetrating the industry to produce high performance parts. Fatigue resistance is one of the key application properties in many engineering components. Fatigue tests are typically time consuming and require a large amount of material to be tested. For AM parts this is especially relevant because the inherent anisotropy of the process requires also to test specimen in different directions. Such situation hampers the rapid development of AM parts. Rapid fatigue testing methodologies are available for bulk materials. The PhD explores the applicability of such</p>	<p>Additive manufacturing (AM) is rapidly penetrating the industry to produce high performance parts. Fatigue resistance is one of the key application properties in many engineering components. AM allows extreme lightweight designs by locally changing material type and part geometry. This is known as topological optimization. The PhD will focus on the development of high fatigue performance parts designed through topological optimization. <i>Further information may be obtained from the Supervisors.</i></p>



<p>materials properties to understand fatigue resistance in AM parts. <i>Further information may be obtained from the Supervisors.</i></p>	<p>rapid resting techniques to assess the fatigue performance of AM specimens. <i>Further information may be obtained from the Supervisors.</i></p>	
<p>Supervisors: Daniel Casellas (EUT) and Antonio Mateo (UPC) and: Raj Das, Andrey Molotnikov (RMIT)</p>		
<p>Research Fields: Advanced Manufacturing and mechatronics, Applied science</p>		

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 11 countries.

As a REDI researcher you will be:

- enrolled by two entities, with the chance to be awarded dual doctorates and gain alumni status from multiple institutions, including the Marie Curie Alumni Association.
- 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.

For more information visit: rediprogram.eu

Are you REDI? (Expected Profile)

Project 1

Your background and skills: Master's degree in materials science, mechanical engineering, or other master's degree in related fields. Good skills in report writing. Self-motivated and autonomous.

Your work experience: Not required.

Your research experience: Not required.

Project 2

Your background and skills: Master's degree in materials science, mechanical engineering, or other master's degree in related fields. Good skills in report writing. Self-motivated and autonomous.

Your work experience: Not required.



Your research experience: Not required.

Project 3

Your background and skills: Master's degree in materials science, mechanical engineering, or other master's degree in related fields. Good skills in report writing. Self-motivated and autonomous. Knowledge in programming and skills in CAD-3D design are also valued

Your work experience: Not required.

Your research experience: Not required.

Employment Benefits and Conditions

EUT offers a 36-months full-time work contract (with the option to extend up to a maximum of 48 months), indicatively starting on 01/09/2022. The position will be based in Manresa (Spain). International travel is foreseen, including to Australia (up to 12 months) and Spain (one week per year). At EUT, there is a probation period of three months and there are 40 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 23.725 EUR gross per year. Of this amount, the estimated net salary to be perceived by the Researcher is 1.380 EUR per month. However, the definite amount to be received by the Researcher is subject to national tax legislation.

Benefits include:

- 27 days paid holiday leave.
- Sick leave.
- Parental leave.
- The candidate will have access to Eurecat facilities and laboratories.
- 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...

Eurecat

Eurecat is currently the leading Technology Centre in Catalonia, and the second largest private research organization in Southern Europe. Eurecat manages a turnover of 50M€ and 650 professionals, is involved in more than 200 R&D projects and has a customer portfolio of over 1.600 business clients. Technology transfer is also an essential activity in Eurecat, with 36 international patents and 7 technology-based companies (eight in Spain and one in Latin America) started-up from the centre. Eurecat R&D, innovation and training activities span from Industrial Technologies to Digital Technologies, and Biotech. Additionally, Eurecat has been accepted by the European Commission as a KETs (Key Enabling Technologies) Technology Centre in order to collaborate with SMEs on close-to-market research and innovation activities.

Eurecat offers his Doctoral Students a wide range of benefits, including:

- **Mentoring program:** Senior researchers provide mentoring to other researchers and students, providing their expertise, and are available for inquiries, questions and share their knowledge. Eurecat scientific direction supervise the thesis progress.
- **Courses and training opportunities:**
 - o General Training: Transversal training promoted by the Talent Management Unit and given by external suppliers and trainers for the development mainly of soft skills but also of those hard skills to be developed for more than one Unit.



- Specific Training: Technical and / or Scientific Training of the managed by Eurecat technological units.
- Internal Training: Internal training (generic or specific) coordinated by the Talent Management Unit and conducted by Eurecat expert workers with the aim of sharing internal knowledge within the organization in different areas.
- Eurecat Academy: Access to the training offer of the Eurecat Training Department, free of charge for workers (social benefit) for their development in soft skills and hard skills.
- BeFlex: Accession to the flexible remuneration plan that allows the employee to replace part of the remuneration to be used for other benefits and products, such as training that is related to work, resulting in a benefit, as the annual amount assigned to training is exempt from tax.
- **Language courses:** English, Catalan and Spanish courses. All employees are offered the opportunity to learn and improve the main languages we work with at Eurecat.
- **Relocation support:** Eurecat can contribute to support the visa process and similar administrative formalities.
- **Engagement with industry:** Eurecat is the leading technological centre in Catalonia dedicated to research and development. Provides to the industrial and business sector with differential technology and advanced knowledge to respond to the innovation needs of companies and to increase their competitiveness. The Doctoral Student will work with industry partners and benefit from specific training (i.e. secondments, site visits, etc.). Particularly, the company TALLERES VIC is willing to contribute in one or more of the following points:
 - Mentoring
 - Access to facilities, samples, data
 - Site visits or short stays
 - Training on use of equipment or techniques
 - Any other useful engagement that supports the doctoral research project

For more information, visit: <https://eurecat.org/>

UPC

The Universitat Politècnica de Catalunya · BarcelonaTech (UPC) is the degree awarding University and is a public institution of research and higher education in the fields of engineering, architecture, sciences and technology, and one of the leading technical universities in Europe. Every year, more than 6,000 bachelor's and master's students, more than 500 doctoral students graduate and 3,067 graduates in lifelong learning. The UPC has a high graduate employment rate: 93% of its graduates are in work and 76% find a job in under three months. It is ranked in the main international rankings.

The UPC has a wide spread presence in Catalonia, with nine campuses located in Barcelona and nearby towns: Castelldefels, Manresa, Sant Adrià de Besòs, Sant Cugat del Vallès, Terrassa, and Vilanova i la Geltrú.

The UPC is an International Campus of Excellence with two projects: the Barcelona Knowledge Campus (BKC) and the Energy Campus. Through these projects, it promotes employability, social cohesion and regional economic development. It interacts with research centres, science and technology parks, businesses and other agents as a hub for attracting talent in emerging research areas. In addition, through its four UNESCO Chairs, the UPC contributes to the exchange of knowledge and fosters cooperation.

The campuses are accessible, well connected by public transport and equipped with the necessary facilities and services to contribute to learning, research and university life.

UPC offers a wide range of training and mentoring opportunities to Doctoral Students including:

- Hola! Cultural and Language Reception Programme and the UPC Language Programme such as basic Catalan and Spanish courses. Visit this website for more information: <https://www.upc.edu/slt/en/language-and-terminology-service/our-services#newtocatalonia>
- MOOC courses
- Summer courses



RMIT

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](https://www.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 general eligibility criteria:

- **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's 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 working visa in Spain (More information):

<http://www.exteriores.gob.es/porta/es/serviciosalciudadano/informacionparaextranjeros/paginas/requisitosdeentrada.aspx>

- 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 Eurecat

You will be enrolled as Doctoral Student at Eurecat for the entire duration of the assignment. At admission, you will need to supply:

- CV
- Cover Letter
- Language certificates

More information: <https://eurecat.org/en/eurecat/work-with-us/>

Admission at UPC

You will be enrolled as Doctoral Student at UPC for the entire duration of the assignment. At admission, you will need to supply a degree certificate and the transcript of records of a Bachelor and Master (original and photocopy) in Engineering, Science or Technology and have completed a master's degree in a field related to the scientific area of the programme.

Homologation of a degree issued under a foreign education system is not required, but the UPC must verify that the degree certifies a level of training equivalent to an official Spanish master's degree and qualifies the applicant for admission to doctoral studies in the country where it was issued. Admission on this basis does not imply homologation of the foreign degree or its recognition for any purpose other than admission to doctoral studies.

The academic committee will consider applications that do not meet these requirements on a case-by-case basis. In general, preference will be given to applicants who hold a master's degree in the sciences as defined in the Bologna Process guidelines.

For the recognition of degree equivalency, the academic committee for the programme will assess to what extent the qualification in question corresponds to one of the master's degrees listed above in terms of the number of credits and the subjects studied. The academic standing of the institution that awarded the degree will also be considered.

Students who hold a master's degree or have completed postgraduate studies recognised by the UPC as equivalent to one of the master's degree's will be admitted to the doctoral programme automatically.

Candidates should demonstrate an interest in the research projects carried out within the framework of the programme; critical and analytical skills; initiative and perseverance in their academic work; the ability to work in a team; and the ability to communicate effectively, both orally and in writing.

More information: <https://doctorat.upc.edu/en/programmes>

Admission at RMIT University

You will also be enrolled as Doctoral Student at RMIT 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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