Position Description

Group of research topics: Advanced Aerospace Structure Design

Position is funded by	- COFUND, Marie Skłodowska-Curie Actions (MSCA), Horizon 2020, European Union - Politecnico di Torino (POLITO), Italy - RMIT University (RMIT), Australia
Research Host	Politecnico di Torino (POLITO), Italy
PhD awarding institution/s:	Dual PhD awarded by POLITO and RMIT
Locations	- Primary: Torino, Italy - Secondary: Melbourne, Australia - Annual workshops in Barcelona, Spain
Contract	Full time, fixed term (36 months + 12 months extension)
Gross annual salary	26350 EUR
Preferred start date	01/11/2022
Deadline for applications	30/04/2022 (Reference: POLITO-DC2)

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

Project 1: Innovative Multifunctionl Aerospace structures	Project 2: Aeroelastic response of very light aircrafts	Project 3: Impact absorbing structures design
The aircraft electrification presents the need to store electricity coupled with a low aircraft weight. Promising approach is certainly multifunctional structures combining structural and electrical functions. Main topics: Analysis of different multifunctional structures configurations at different integration levels; Perform coupled structural and electrochemical numerical analyses; experimental tests to validate the numerical models are welcomed but not mandatory. *Further information may be obtained from the Supervisors.*	New low weight aircraft configurations exhibit aeroelastic instabilities due increased flexibility. Aeroelastic tailoring is a fundamental tool to cope with safety requirements. Multidisciplinary approach including theoretical, computational, and experimental studies is necessary. Potential topics are: new design concepts for future aircrafts; Advanced numerical model development for aero-structural analyses and process simulation; Uncertainty in composite structures; experimental tests. *Further information may be obtained from the Supervisors.*	Impact damage poses a serious threat to the safety of aircraft containing primary structure made from fibre composite material. Promising configurations are structure with high-energy absorbing capacity and passive/active damping performance like origami-based morphing structures or innovative sandwich design. Vulnerability, durability and reliability of such advanced structures and subsequent implications for aircraft safety and operational availability are the main topics. *Further information may be obtained from the Supervisors.*
Supervisors: POLITO: Assoc. Prof. Enrico Cestino, Giacomo Frulla (co-supervisor)	**Supervisors:** POLITO: Assoc. Prof. Enrico Cestino, Giacomo Frulla (co-supervisor)	**Supervisors:** POLITO: Assoc. Prof. Enrico Cestino, Giacomo Frulla (co-supervisor)

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RMIT: Adrian Orifici (Senior Supervisor) Pier Marzocca (Associate Supervisor)	RMIT: Vincenzo Muscarello (Senior Supervisor) Pier Marzocca (Associate Supervisor)	RMIT: Jonathan Tran (Senior Supervisor) Pier Marzocca (Associate Supervisor)
Research Fields: Multifunctional structure, Electrochemical simulation, Structural batteries, aero-structural interaction, low speed impact simulation on composite structure, Experimental tests.		

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 in Aerospace Engineering with experience in structural design and numerical simulation. Experience in electrical aircraft design and energy storage systems. Experience in structural optimization with commercial FEM codes (NASTRAN/LSDYNA et al.). Autonomy in solving complex problems. Ability to work in teams with different backgrounds. Ability to adapt to program variations.

Your work experience: not strictly necessary but taken into consideration if any of at least one year and if related to the research topic

Your research experience: not strictly necessary but taken into consideration if related to the research content

Project 2

Your background and skills: Master's in Aerospace Engineering with experience in aero-structural design and numerical simulation. Experience in aeroelastic design (numerical-experimental). Experience in structural optimization

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with commercial FEM codes (NASTRAN/LSDYNA other aeroelastic codes). Autonomy in solving complex problems. Ability to work in teams with different backgrounds. Ability to adapt to program variations.

Your work experience: not strictly necessary but taken into consideration if any of at least one year and if related to the research topic

Your research experience: not strictly necessary but taken into consideration if related to the research content

Project 3

Your background and skills: Master's in Aerospace Engineering with experience in structural dynamic simulation and design. Experience in low velocity impact numerical and experimental evaluation. Experience with implicit-explicit commercial FEM codes (NASTRAN/LSDYNA other codes). Autonomy in solving complex problems. Ability to work in teams with different backgrounds. Ability to adapt to program variations.

Your work experience: not strictly necessary but taken into consideration if any of at least one year and if related to the research topic

Your research experience: not strictly necessary but taken into consideration if related to the research content

Employment Benefits and Conditions

POLITO offers a 36 months + 12 months full time work contract, indicatively starting on 01/11/2022. The position will be based in Torino (Italy). International travel is foreseen, including to Australia (up to 12 months) and Spain (one week per year). At POLITO, there is no probation period (average working hours per week is 36 hours).

The remuneration, in line with the European Commission rules for Marie Skłodowska-Curie grant holders, will consist of a gross annual salary of 26350 EUR. Of this amount, the estimated gross salary to be perceived by the Researcher is 2.195.83 EUR per month. However, the definite amount to be received by the Researcher is subject to national tax legislation.

Benefits include:

- Students will be employed full-time with contributions covering sickness and parental leave.
- Accidents during working hours are covered by the Italian government agency (INAIL) for the insurance against work-related injuries.
- For the academic year 2022/23, public transport ticket and Museum pass could be provided on discounted prices.
- Discounts in shops, libraries, sport facilities, cinemas and theatres, as well as a set of services for work-life balance are provided by the Association to Polincontri.
- 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.

For more details, please see: https://didattica.polito.it/iniziative_mobilita_en.html

REDI to apply? First a little more about us…

POLITO

Politecnico di Torino (PoliTO), founded in 1906 from the roots of the Technical School for Engineers created in 1859, has a long-standing tradition of scientific leadership and innovation and an excellent research environment, in terms of knowledge, expertise, teams, infrastructures, facilities and services. It is one of the most important universities in Europe for engineering and architecture studies, strongly committed to collaboration with industry: indeed, PoliTO is among the top Engineering and Technology universities in the world, the 41th according to the QS University

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Rankings 2020 by broad subject. Since 2013, the quality of the research environment has been awarded by the European Commission with the 'HR Excellence in Research Award'.

For Politecnico di Torino the project sees the involvement of the Department of Mechanical & Aerospace Engineering (DIMEAS), and of the Department of Applied Science and Technology (DISAT).
PoliTO has implemented measures dedicated to equal opportunities and female empowerment. In 2018 by sharing and implementing the principles of the European Charter for Researchers, a new governance structure of Equality@PoliTO has been created.
POLITO university offers to its Doctoral Students a wide range of benefits, including:

- **Mentoring program:** The Academic Board provides each doctoral candidate with a research topic and an Academic Supervisor who supervises his/her doctoral education. The Supervisor is the candidate's focal point within the Academic Board and is responsible for the research activities and progress of the doctoral candidate as well as for his/her compliance with the ethical principles of the international scientific community and the Code of Ethical Conduct of the University.

- **Courses and training opportunities:** The courses on offer can be divided into three macro categories: Hard skills (Technical Skills), Soft skills (Transversal skills) and High level courses (Excellence training).
  For more information, visit: http://dottorato.polito.it/en/courses_offered

  Language courses: not Italian Doctoral candidates will have to attend the Italian language course offered by the University Language Centre.
  If a certificate has already been obtained, it has to be provided to the administrative offices.

- **Relocation support:**
  Polito offers support to students such as:
  - Support in finding accommodation as described in the following link https://international.polito.it/practical_information/accommodation
  - Support in bureaucracy offered by the department in which the Candidate is employed

  Polito also offers kindergarten and baby parking services under the name of "Policino". The availability to this kind of services must be verified on site.

- **Cultural and social activities:**
  The candidate will have the opportunity to subscribe to Polincontri, an association for those who study and work at the Polytechnic of Turin, that inspires the style of free time by proposing itself as a container for Culture, Entertainment, Sports and more.
  You can discover more by following the link: https://www.polincontri.polito.it/chi_siamo

- **Engagement with industry:** The candidate will work in collaboration with ITACAe srl. The benefits include:
  _ access to tools and resources such as data sets and/or prototypes and technical training if necessary.
  _ short stays at ITACAe facilities for REDI Researchers as part of their intersectoral doctoral training.

For more information, visit: www.polito.it/index.php?lang=en

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

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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:
    - *Career Mentoring* - career guidance from industry professionals from all disciplines and global locations.
    - *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)
    - *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 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 Italy 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**.

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

- Apply for a student visa in Italy (More information): https://vistoperitalia.esteri.it/home/en#BMTitolo
- 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 POLITO

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

- A Master's degree in Aerospace Engineering is required for Projects in the area of Aerospace Engineering.
- The M.Sc. degree (i.e. 2° level title, as defined by the Bologna Process) should be issued by an officially recognized academic institution, which grants admission in PhD programmes in the country of issuance in a discipline related to the research project of your choice.
- IELTS with a minimum score of 5.0; **OR**
    - one of the language certificates recognized equivalent to IELTS 5.0 by the Foreign Languages Centre and detained in the table published at the webpage: https://didattica.polito.it/zxd/b5eda0a74558a342cf659187f06f746f/9dde3c1deee7c791026d6a0ac91322bb/815f4c1f644cb627e050c0828c371966?1549616887585 **OR**
    - a declaration of having a Ba. and/or M.Sc. degree issued by a University in which courses are taught in English, i.e. “The medium of instruction was English”.

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

- CV
- Cover Letter
- MSc degree and transcript of records
- BSc degree and transcript of records
- GRE test certificate
- IELTS certificate 5.0 or equivalent

For detailed and complete information please visit:
http://dottorato.polito.it/en/requirements_and_procedure_for_admission

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

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

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