



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

DEPARTMENT
OF CIVIL, CHEMICAL,
ENVIRONMENTAL, AND
MATERIALS ENGINEERING



Funded by the
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JOB TITLE	DC POSITION IN MET2ADAPT DOCTORAL NETWORK
INDIVIDUAL PROJECT TITLE	DC8 - On the combined use of WECs and meta-structures for fatigue-life extension of existing offshore structures
HOME INSTITUTION	Alma Mater Studiorum - Università di Bologna (UNIBO)
DEPARTMENT	Department of Civil, Chemical, Environmental, and Materials Engineering (DICAM), Bologna, Italy
POSTAL OFFICE HOME	40136 Bologna, Italy
MAIN SUPERVISOR FOR DC8 AND SCIENTIST IN CHARGE AT UNIBO FOR MET2ADAPT	Prof. Antonio Palermo, Department DICAM, UNIBO
CO-SUPERVISOR AT MAIN SECONDMENT HOST ENTITY	Prof. Daniel Colquitt, University of Liverpool, UK
INDUSTRIAL MENTOR	Professional from Sizable Energy SRL, IT
START DATE	November 1st, 2026
DURATION	36 months
DC8 PROJECT DESCRIPTION	DC8 will focus on developing solutions for reducing vibrations in offshore structures by attenuating the amplitude of wave loads and/or mitigating their dynamic response to wind loading. This approach aims to extend the lifespan of offshore structures by reducing fatigue-induced stresses. To achieve this, two complementary strategies will be explored. First, resonant meta-structures, positioned around the offshore structures, will be investigated. Acting as a distributed set of tuned mass dampers, these structures will help reduce the structural response. Additionally, inertial amplification systems will be examined as supplementary mechanisms to further enhance wave mitigation. Alongside meta-structures, the optimal placement and use of wave energy converter farms around offshore structures will also be studied for wave amplitude reduction. In collaboration with DC7 and DC5, DC8 will contribute to WP3 by developing analytical and numerical models to design and optimize meta-structures for wave energy concentration and coastal protection. Fluid–metastructure interaction models, linear and nonlinear bandgap engineering, and topology optimization will be employed to enhance energy extraction efficiency while mitigating wave overtopping and fatigue in offshore structures. The models will be validated through scaled experiments in wave-basin facilities. Collaboration with the industrial partner Sizable Energy (SZL) will be pursued to explore applications in offshore hydropump systems.
OBJECTIVES	To achieve these goals, two primary objectives have been identified: (i) To develop analytical and numerical models capable of describing the dynamics of resonant submerged meta-structures, accounting for fluid-



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	<p>structure interaction. (ii) To obtain the combined optimal design/distribution of the meta-structures and WECs around the offshore structures so to maximize the fatigue life and integrity while minimizing the overall material consumption/cost. Small-scale prototypes will be developed and tested in the DICAM wave basin (https://site.unibo.it/vasca-marittima/it).</p>
PLANNED SECONDMENTS	<p>University of Liverpool (UK) for 4 months. Additional secondments of up to 4 months may be planned at other associated partners.</p>
INSTITUTION DESCRIPTION AND WORKING PLACE	<p>The University of Bologna is one of the largest and most active Italian universities in research and technology transfer in Italy. It stands among the most important institutions of higher education in EU. In recent years, the University of Bologna (Alma Mater Studiorum) has positioned itself as one of the leading Italian universities in terms of acquisition of competitive research funding, particularly at the European level.</p> <p>The successful applicant will be based in the Department of Civil, Chemical, Environmental, and Materials Engineering (DICAM). Bologna's DICAM Department hosts various Research Centres and 12 laboratories that operate in all specific areas of Civil, Chemical, Environmental and Materials Engineering. The research group is part of the SMASH Research Laboratory (Smart Materials and Structural Health Monitoring - SMASH) and for over 10 years it has been conducting research and experimentation in solid and structural mechanics, experimental dynamics, signal processing, vibration control. DICAM offers a wide range of PhD programmes, among which the PhD in Civil, Chemical, Environmental, and Materials Engineering with the curriculum in structural engineering which will host the researcher during their doctoral training. DICAM staff can share consolidated expertise in the coordination of trans-disciplinary research projects and other European projects. The project will take place at the LAMC Laboratory of the University of Bologna. A secondment is scheduled for 4 months at the University of Liverpool, UK.</p>
CANDIDATE PROFILE	<p>The candidate is required to have obtained a degree giving access to the PhD school by 31/08/2026, and NOT to hold any PhD degree (see eligibility below). The ideal candidate is passionate about structural dynamics, vibration mitigation, wave–structure interaction. Good communication skills in English are compulsory. Willingness to travel internationally for the purpose of research, training and dissemination is mandatory.</p>
REQUIRED DEGREE	<p>A Master's degree (or equivalent) in Civil Engineering, Environmental Engineering, Mechanical Engineering, or related fields.</p>



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<p>ELIGIBILITY REQUIREMENTS</p>	<p>There are strict eligibility rules for the recruitment of Doctoral Candidates in Horizon Europe Marie Skłodowska-Curie Doctoral Network funded projects.</p> <p><u>Career</u>: applicants must be doctoral candidates at the date of recruitment. They must have obtained a degree which formally entitles them to access a doctorate and they must not have already been awarded a doctoral degree. A PhD degree in any field is not compatible with this DC position. Candidates who have successfully defended their doctoral thesis, but who have not yet formally been awarded the doctoral degree will not be considered eligible.</p> <p><u>Mobility</u> (transnational): transnational mobility is an essential requirement of Marie Skłodowska-Curie Doctoral Networks. Applicants may be of any nationality and any age, but they must not have resided or carried out their main activity (work/study) in Italy for more than 12 months in the 36 months immediately before the recruitment date.</p> <p><u>Secondments</u>: applicants must be prepared to undertake transnational mobility during the project of up to 8 months.</p> <p>According to Italian law, applicants <u>must not have obtained</u> a second cycle/two-year master's degree or a single cycle master's degree in Italy, or an equivalent qualification obtained abroad, <u>more than six years before the deadline for the application</u>.</p>
<p>REQUIRED SKILLS/QUALIFICATIONS</p>	<p>We are seeking a motivated and talented PhD candidate with a Master's degree (or equivalent) in Civil Engineering, Mechanical Engineering, Offshore Engineering, Physics, or a closely related discipline. Proficiency in MATLAB and/or Python is required, as the research will involve numerical modeling, simulation, and data analysis. Good communication skills in English and ability to understand and express in both written and spoken English are compulsory.</p>
<p>PREFERRED SELECTION CRITERIA</p>	<p>The ideal candidate is passionate about structural dynamics, vibration mitigation, wave–structure interaction. A strong background or interest in fluid–structure interaction, or metamaterials will be highly appreciated. Experience with finite element modeling and vibration laboratory testing will be considered a valuable asset. Enthusiasm for research, together with the ability to work both independently and collaboratively, are essential qualities for this position.</p>
<p>EVALUATION AND INTERVIEW</p>	<p>The selection of the suitable candidates will be performed by members of the Recruitment Committee (RC) of the Network.</p> <p>In assessing which candidate is best qualified, emphasis will be placed on education, experience, and personal and interpersonal qualities, in accordance with the criteria identified by the consortium. Motivation, ambition, and potential will also be considered in the evaluation of candidates. The selection process will consist of several steps.</p>



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	<p>After verifying that candidates meet all eligibility requirements, the CVs, motivation statements, and track records of eligible applicants will be evaluated.</p> <p>A shortlist of candidates who match the required profile will be interviewed online to assess their skills, motivation, and fluency in English. Following the interviews, some applications may be rejected.</p> <p>The successful candidates will be ranked based on both their documentation and their interview performance. The highest-ranked candidate will be offered the position. If, for any reason, the selected candidate declines the offer or fails to meet the enrollment requirements for the position, the next candidate on the ranking list will be selected.</p>
<p>EMPLOYMENT CONTRACT AND REMUNERATION</p>	<p>The selected candidate will be appointed under a 36-months full-time employment contract with full social security and fiscal coverage, as foreseen by the Italian national legislation.</p> <p>The remuneration will be compliant with the rules of the DN-MSCA, as by the Horizon Europe Marie Skłodowska-Curie Actions Work Programme 2024 “Applicable unit contributions”. The gross amount per year of the salary includes the living allowance (45.858,36€ comprising the country-specific correction coefficient for Italy), the mobility allowance (8.520€) and the family allowance if eligible (7.920€). These gross amounts include all compulsory deductions under national applicable legislation (taxes depend on the country of the host entity).</p>
<p>SPECIFIC DUTIES AND RESPONSIBILITIES OF THE POST</p>	<p>Doctoral candidates do research while being guided by supervisors and at the same time fulfill a PhD training program. The goal is to complete the doctoral education and to obtain a doctoral degree from UNIBO. They will be required to:</p> <ul style="list-style-type: none"> • Attend the project-wide training program with the other DCs candidates and all other project events. • Perform the secondments. • Attend the PhD courses, successfully complete and submit a PhD thesis before the project ends.
<p>EXPECTED PHD DEGREE</p>	<p>PhD degree from Alma Mater Studiorum - Università di Bologna (Italy)</p>
<p>HOW TO APPLY - DOCUMENTATION</p>	<p>The applicant should provide the following documentation (please see and complete the ‘Application Form’):</p> <ul style="list-style-type: none"> - The Application Form duly completed; - A Curriculum Vitae signed and dated, preferably in Europass format (https://europass.cedefop.europa.eu/documents/curriculum-vitae). including education, work experience, a complete list of publications (if any) and/or participation to scientific meetings, relevant other activities and previous scientific experiences.



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	<ul style="list-style-type: none">- A letter of motivation, including research interests, reasons for applying for this programme, etc.- A research proposal with reference to the specific DC8 position, (max 1000 words), articulated as follows: state of the art; goals; methodology; expected results; implementation times; references outlining the innovative ways in which they will design the specific DC8 project. Please note that the specific research proposal that successful applicants shall carry out during their PhD career may differ from the one proposed at the application stage, since it will be agreed with the supervisors and PhD board.- Copy of university diplomas and study certificates (including the Transcripts of records, grades and university courses).- The applicant must also provide the name and contacts of 2 referees (at least 1 academic: employer, supervisor, etc.) with reference letters in English.- English Language Certificates (if available).
HOW TO APPLY - LINK AND FURTHER INFORMATION	<p>https://dicam.unibo.it/DC8 https://euraxess.ec.europa.eu/jobs/392117 http://users.ntua.gr/savtri//metadapt/</p>