



CALL FOR APPLICATIONS FOR THE AWARD OF RESEARCH FELLOWSHIPS
Regulation on Research Fellowships pursuant to Italian Law no. 240/2010
Politecnico di Bari, issued by Rectoral Decree no. 252 of 05/07/2016

D.R. n. 465/2016

Purpose

Applications are invited for the selection running at: Department of Mechanics mathematics and management of the Politecnico di Bari for the award of:

-n. 1 professional grant research fellowship, for the execution of research activities within the project entitled: "*Bibliographic and experimental study of the laser deposition process (DL)*", according to the annexed Activity Programme:

The Direct Metal Deposition process is an Additive Manufacturing (AM) technique that allows not only to restore the airplane damaged metal parts, but it is able to create hardeners overs, and, therefore, wear resistant, on the surfaces of worn parts. All this leads to a considerable reduction in costs and a smaller environmental impact.

Will be performed bibliographic and patent researches to define the state of the art of the process, of the feasible types of repair, of a commonly used material, and of theoretical. analytical and numerical models inherent to the process parameters and their influence on the final characteristics. DOE techniques will be used to set up a testing program and will be carried out experimental deposition campaigns up to the optimization of process parameters.

The final result will be a report with the achieved results and the execution of the deposition process on some test articles.

-n. 1 professional grant research fellowship, for the execution of research activities within the project entitled: "*Bibliographic and experimental study of the laser Cold Spray (CS)*", according to the annexed Activity Programme:

The Cold Spray (CS) is a deposition technique, in which solid particles are accelerated by means of a supersonic gas jet. During the impact with the substrate, the particles undergo a plastic deformation and adhere to the surface. Unlike the thermal deposition techniques, the powders are not melted during the process. Because of its inherent characteristics, the CS sets new innovative technology to restore or for cladding aeronautical worn parts.

After an accurate literature and patent research on the state of the art, experimental deposition campaigns will be made up to the optimization of process parameters. Analytical and numerical models will be used to reduce the number of specimens needed, together with experimental plans drawn up in accordance with the techniques of Design Of Experiment. The result will consist in a report with optimized values of the main process parameters and deposition on some real test cases.

-n. 1 professional grant research fellowship, for the execution of research activities within the project entitled: "*Reverse engineering of aeronautical components aimed at their repair by means laser deposition (DL) and cold spray (CS) processes*", according to the annexed Activity Programme:

The integrity of all parts of an aircraft must be checked periodically to maintain the maximum security. The need to contain costs has prompted research to move towards techniques such as Direct Metal Deposition (DMD) and Cold Spray (CS), which allow to repair some functional parts. However, knowing the surface state is required to act in a timely and accurate way on the worn piece. The reverse engineering process, in this regard, becomes essential for the reconstruction of the parts.

The researcher will compare the nominal models with real models for deciding the most suitable deposition strategy and he will make the programming of robots adopted for the realization of the two deposition processes to be used for the repair.

It will also deal with the optimization of the part program and the deposition strategy to optimize consumption of raw materials and deposition times.

-n. 1 professional grant research fellowship, for the execution of research activities within the project entitled: *“Characterization of the deposits obtained by laser deposition (DL) and cold spray (CS)”*, according to the annexed Activity Programme:

During the maintenance phase, all components that have worn or damaged surfaces are replaced. However, the need to contain costs and the development of new technologies has prompted the research to be directed toward techniques that allow to repair some functional parts (for example, turbine blades), as the Direct Metal Deposition (DMD) and the Cold spray (CS).

To check the quality of the process parameters used in each application the specimens are to be subjected to analysis. The activity will be, therefore, to prepare samples, resulting from the DMD and CS techniques, to be submitted to macro and micrographic analysis, of micro / macro hardness measurements and verify the compliance with the acceptability requirements of the performed work. They will be identified any defects and will give indications on the process parameters to improve the specimens. It will be drawn up a report on macro analysis and micrographic and the macro/micro hardness measurements.

- n. 1 post doctoral grant research fellowship, for the execution of research activities within the project entitled: *“Finite element modeling of Laser Deposition (LD) and Cold Spray (CS) processes”*, according to the annexed Activity Programme:

The need to contain costs and the development of new technologies, in the aviation industry, has prompted research to move towards techniques to repair some functional parts (eg turbine blades), instead of replacing them with ex novo pieces. Additive manufacturing techniques such as Direct Metal Deposition (DMD) and Cold Spray (CS), are well suited to this role. In fact, by adding powder selectively, by means these techniques it is possible restore the damaged or worn part in few simple steps. However, the physics of these processes is still poorly known. In this context, it is necessary to develop numerical models in order to expand the understanding of themselves and to develop predictive models. It will be, therefore, constructed and implemented models for the purpose of efficient management of the process optimization.

The call for applications for the research fellowship issued pursuant to the University Regulation issued by Rectoral Decree (D.R.) no. 252/2016.

The activities shall be carried out under the supervision of a tutor, Scientific Responsible Prof. Mariagrazia Dotoli in a non-subordinate relationship with no set working hours.

The main place of work will be: Department of Electrical and Information Engineering of the Politecnico di Bari of the Politecnico di Bari, VIA ORABONA,4 , BARI, ITALY

Requirements for candidacy

The selection is open to candidates in possession of the following qualification:

- Degree in mechanical or industrial engineering or physics, for the position *“Bibliographic and experimental study of the laser deposition process (DL)”*
- Degree in mechanical or industrial engineering, for the position *“Bibliographic and experimental study of the laser Cold Spray (CS)”*
- Degree in mechanical or management engineering, for the position *“Reverse engineering di componenti aeronautici finalizzata alla loro riparazione con Deposizione Laser (DL) e Cold Spray (CS)”*
- Degree in mechanical or industrial engineering, for the position *“Caratterizzazione dei depositi ottenuti mediante deposizione laser (DL) e cold spray (CS)”*
- PhD in mechanical design and biomechanics for the position *“Simulazione agli elementi finiti dei processi di Deposizione Laser (DL) e Cold Spray (CS)”*.

Candidates must possess the admission requirements on the deadline for submission of applications laid down in this call.

The selection is not open to any persons who are related by blood or by marriage up to the fourth degree, to a professor working in the department or structure for which the call is issued, or to the Rector, Director General or a member of the Board of Governors of the University.

The selection is also not open to anyone who has held research fellowship contracts with any institution, pursuant to Italian Law no. 240/2010, for a period which, summed to the foreseen duration of this contract, exceeds a total of 6 years, excluding any period in which the contract coincided with a PhD without scholarship, for the maximum limit of the legal duration of the PhD programme.

Furthermore the selection is not open to anyone who has had research fellowship or fixed-term researcher contracts at the Politecnico di Bari or any other state-funded, private-funded or distance-learning Italian university pursuant to articles 22 and 24 of Italian Law 240/2010, or with any other body listed in paragraph 1 of Art. 22 of Italian Law 240/2010 for a period which, summed to the foreseen duration of this contract, exceeds a total of 12 years, even if not consecutive. For the purposes of the duration of the above-described periods, in compliance with the laws in force any periods of maternity or sick leave shall not be calculated.

Application

The application for selection, in a sealed envelope and bearing the title indicated in the call for proposal for the Research Fellowship, addressed to the magnificent Rector of Politecnico di Bari, via Amendola 126/b, 70126 Bari, Italy, drawn up on unmarked paper (according to the annexed model), shall be delivered not later than 23/11/2016

Any applications received beyond the deadline will not be accepted.

The application may be presented:

- Shipping by registered mail with return receipt, not later than 23/11/2016 at: Politecnico di Bari, Via Amendola n. 126/B, 70126 Bari (Italia);
- Shipping by e-mail PEC at: didatticaericerca.poliba@legalmail.it not later than 23/11/2016.
- delivered by hand at Protocol Office of Politecnico di Bari, Via Amendola, 126/b - 70126 Bari – not later than 23/11/2016 at the following times: Monday. – Thursday From 10.00 to 12.00, Tuesday from 15,00 to 16,30

The structure shall assume no liability for the non-delivery of correspondence which is not the result of errors made by its own staff.

In the application the candidates must, under their own responsibility, indicate:

- surname and name;
- date and place of birth;
- nationality;
- residence and chosen address for correspondence for the purposes of this selection;
- that they do not have a criminal record and are not involved in any current criminal proceedings (or if so, state which);
- that they possess the qualification of..... in, obtained from..... on (date)..... (indicate the qualifications required as stated in article 2 of the call for applications

or

- that they possess an academic qualification obtained abroad, which is deemed equivalent.

The candidates in possession of a qualification obtained abroad must annex to their applications a translation into Italian of their foreign qualification, accompanied by a sworn statement that it is a faithful translation of the original certificate.

The foreign qualification may be declared admissible by the Evaluation Board, solely for the purposes of admission to the selection procedure.

In case of award, the winning candidates having obtained their qualification in a country outside of the European Union, must provide the Structure, in the same manner as laid down for

the presentation of applications, the official translation with a declaration of value of the foreign qualification issued by the competent diplomatic representation or Italian consulate in their home country, in accordance with the applicable laws.

Candidates must enclose the following with their applications:

- their scientific and professional curriculum vitae;
- thesis;
- certificates of all qualifications to be assessed according to art. 3 of this call for applications. Academic and professional qualifications issued by Italian public administrations must be self-certified or submitted in an unstamped photocopy, as provided for in art. 15 of Italian law no. 183/2011, by way of a simple declaration of certification pursuant to articles 46 and 47 of Italian Presidential Decree (DPR) 445/2000.

Candidates are admitted to the selection procedure with reserve.

At any time, even after participation in any tests, the Administration may, with justification, exclude them from the selection procedure. The concerned candidate will be notified of such exclusion.

Comparative assessment of the candidates and the Evaluation Board

The candidates will be assessed comparatively by a Commission appointed by a Rectoral Decree, and formed by three professors of Politecnico di Bari.

The selection procedure focuses on the examination of the selection criteria laid down in advance by the Commission, the candidates' scientific-professional curriculum and the scientific work and publications resulting from the documents enclosed with the application as well as an interview, aiming to verify the suitability of the candidate for carrying out the research programme.

During the interview, the Commission will also verify the candidates' knowledge of the foreign language(s) required in the announcement on relevant sectoral topics.

Only for candidates residing or domiciled outside the Italian territory, upon their request, the oral exam may be held also by using Skype. These applicants have to prove their identity to Commission by showing the colour ID document already attached in the application. In that case these candidates will also have to produce, together with the documentation pursuant to art. 3, Annex C duly filled.

Notice about date and location where the oral examination will be published on the online register praetorian (Albo pretorio) of the Politecnico of Bari.

To be admitted for interview, the candidates must show a valid ID document.

At the end of the selection procedure, the Board will draw up a list of candidates with relative scores, and the final ranking of the selection will be published on Politecnico's online register praetorian by a Rectoral Decree.

If two candidates receive the same scores, preference will be given to the younger candidate. The successful candidate has to send to Protocol office of Politecnico di Bari, Via Amendola n. 126/B, 70126 Bari, within 15 days starting from the day after of final ranking publication the following documents:

- a) declaration of acceptance of the research fellowship, by filling up the form available on www.poliba.it/Ricerca/Assegni di Ricerca;
- b) photocopy of ID documents
- c) photocopy of Italian fiscal code (if available).

Duration and amount of the contract

The contract has a duration of **12 months** and may be renewed and/or extended in the terms laid down in the University Regulation concerning research fellowships, as issued by D.R. no. 60/2016.

The gross amount of the research fellowship contract is € 26.214,60 (post doctoral), per annum. The amount is exempt of withholding tax and includes all statutory social security charges the Research Fellow is subject to.

The amount will be paid in deferred monthly payments.

Non-accumulation, incompatibility, leave

1. The position of research fellow is incompatible with the following positions:

a) fixed-term and full-time staff employed by the bodies listed in art. 22 para. 1 of Italian Law no. 240/2010;

b) persons employed by any private bodies, on a fixed term, permanent or part-time basis; For staff of any Public Administration other than those listed in letter a) refer to the provisions of point 2 below;

c) persons with fixed-term research contracts with any university;

d) adjunct professors with official teaching responsibilities in degree programmes or specialisation schools in any university;

e) persons enrolled in any first, second or single cycle degree programmes, PhD programmes with scholarships or specialisation school. Self-funded research contracts are compatible with enrolments in non-medical specialisation schools, for which no study grant or contract is foreseen or master's degree only where authorised in advance by the structure Director, and having sought the opinion of the tutor.

f) persons awarded research fellowships at any other body.

2. Employees of public administrations other than those listed in point a) with a fixed-term, permanent or part-time contract shall take unpaid leave of absence for the whole period of the research contract.

3. Freelance professional activities are compatible with the research fellowship contract where authorised in advance by scientific responsible and having verified that the activities in addition to the research fellowship do not prejudice the regular execution of the contract.

4. The accumulation of the research fellowship contract with study grants awarded for any purpose is not permitted, with the exception of those granted by national or foreign institutions for the purposes of integrating the research activities with study periods abroad.

5. The above requirements must be possessed from the moment of entry into force of the contract. The winning candidate shall sign a specific affidavit undertaking to notify the department of any variations in the declared situations as soon as they occur.

Reference norms

For any matters not laid down in this call for applications, refer to the "Politecnico di Bari Regulation for the awarding of grants for cooperation in research activities" by Rectoral Decree no. 252 dated 05.07.2016 and other statutory regulations in force.

The personal data provided by the candidates in their applications, pursuant to articles 7 and 13 of Italian Legislative Decree no. 196 of 30.06.03, shall be processed for the purposes of managing the selection procedure and the contract.

This call for applications will be published on the Politecnico di Bari Portal, on the MIUR website.

Date, 04/11/2016

The Rector
Prof. EUGENIO DI SCIASCIO

