



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Purpose: Public comparative procedure for the recruitment of 66 researchers with a full-time fixed-terms employment contract for three years, pursuant to art. 24 paragraph 3 letter a) (junior) of Law no. 240/2010, as part of the National Recovery and Resilience Plan (PNRR), Mission 4 "Education and Research" - Component 2 "From Research to Business.

THE DIRECTOR

- WITH REFERENCE TO** the Regolamento UE of February 12th, 2021, no. 2021/241, which established the Dispositivo per la Ripresa e la Resilienza;
- WITH REFERENCE TO** the National Recovery and Resilience Plan (PNRR), presented to the European Commission on April 30th 2021 pursuant to art. 18 of Regulation (EU) no. 2021/241 and approved by decision of the ECOFIN Council of July 13th 2021 notified to Italy by the General Secretariat of the Council with note LT161 / 21 of July 14th 2021, which plan consists of 6 missions and 16 components, and in particular considering the Mission 4 Component 2 (M4C2) "From Research to Business" which aims to support investments in research and development, to promote innovation and the diffusion of technologies, to strengthen skills by promoting the transition to a knowledge-based economy , covering the entire supply chain of the research and innovation process, from basic research to technology transfer;
- WITH REFERENCE TO** the Projects approved under the PNRR and related to the following notices:
- «Public notice for the presentation of intervention proposals for the Strengthening of research structures and creation of "national samples" of R&D on some Key Enabling Technologies to be financed under the National Recovery and Resilience Plan», announced with Directorial Decree n. 3138 of 16th December 2021 (so-called National Championships Announcement);
 - «Notice for the presentation of intervention proposals for the creation and strengthening of innovation ecosystems», announced with Directorial Decree no. 3277 of 30th December, 2021 (so-called Innovation Ecosystems Call);
 - «Public notice for the presentation of project proposals for "Strengthening and creation of Research Infrastructures"» to be funded under the NRP, announced with Directorial Decree no. 3264 del 28th December, 2021 (so-called Research Infrastructure Call);

«Public notice for the presentation of intervention proposals for the creation of “Partnerships extended to universities, research centers, companies for the financing of basic research projects”», announced with Directorial Decree no. 341 of 15th March 2022, here in after "Extended Partnership Call";

- WITH REFERENCE TO** the notice published in the Official Gazette - 4th special series of 13th December 2022 with which the University of Bologna has published a selection notice for the assignment of fixed-term research contracts of type a), pursuant to law no. 240, art. 24, paragraph 3, letter a) (RTDA) to be applied to PNRR resources
- WITH REFERENCE TO** the rules referred to in Article 13 of the present call for application;
- WITH REFERENCE TO** the resolutions of the Departments for which the positions are activated, adopted pursuant to art. 17 of Reg. no. 344 of 29th March 2011;
- WITH REFERENCE TO** the resolution of Board of Governors of 24th October 2022

ORDERS

Art. 1 – Purpose

Procedures of comparative evaluation by qualifications and public discussion are called for the recruitment of 66 researchers with a full-time fixed-term employment contract for three-year pursuant to art. 24 paragraph 3 letter a) (junior) of Law no. 240/2010.

An annual gross salary equal to € 36.840,00 will be corresponded. The annual increase in this amount will be calculated according to the existing procedure for non-contracted personnel.

The contracts are activated with resources from the National Recovery and Resilience Plan (PNRR).

The specific elements of each position are defined in the relative attachment. In the case of procedures for the selection of multiple positions, the specific elements of each of them will be specified in the relative attachment.

In the following articles, where there are specific elements of each selection, reference is made to the attachments.

Art. 2 – Activities to be performed

The researchers will have to carry out 350 hours of supplementary teaching and assistance to students, for each academic year covered by the contract.

The hours of frontal teaching on annual basis are indicated in each attachment.

If required by each attachment, the researchers will perform medical care services in line with the methods defined by the hospital for all contracted university research staff.

In this regard, Articles 5 and 6 of Italian Legislative Decree 517/99 and amendments are applied, as well as regional laws and local agreements.

The medical activity will be related to the research projects described in this call for applications.

Concerning the provisions of art. 10 of the Reg. regarding fixed term researchers, issued by Rectoral Decree no. 344 of March 29th 2011 and amendments, the project that each winner will have to develop and the scientific productivity objectives are explained in the relative attachment.

Art. 3 – Admission requirements

The selection is also open to those who come from non-EU countries.

Each attachment specifies the necessary requirement to be able to participate in the relative selection.

In particular, either the possession of the PhD or, for the sectors concerned, of a medical specialization diploma may be required.

In any case, applicants must be in possession of qualification at the date of the deadline for the submission of applications to the present selection.

In case of PhD obtained abroad, please include a statement of equipollence with the Italian PhD title pursuant to art. 74 of D.P.R. 382/1980 or the statement of equivalence with the Italian PhD title pursuant to art. 38 of Legislative Decree. N. 165/2001.

In case of High School of Specialization obtained abroad, please include a statement of equivalence with the Italian title pursuant to art. 38 of Legislative Decree. N. 165/2001, or art. 74 of D.P.R. 382/1980.

In both cases, pending the release of the only result of equivalence by the designated offices, it is possible to produce the delivery receipt of the request instance of the same (for the release procedure, see page:

<http://www.cimea.it/it/servizi/procedure-di-riconoscimento-dei-titoli/riconoscimento-non-accademico.aspx>).

In any case the proof of the equivalence of the foreign qualification must be produced to the administration prior to beginning service.

Applications from professors, associate professors, or researchers with tenure will not be accepted, even if the applicant is not in service.

The selection is not open to any persons who are related by blood up to the fourth degree, to a professor working in the Department that proposed the activation of the single contract, or to the Rector, Director General or a member of the Board of Governors of the University. Furthermore, the selection is not open to anyone who has had research fellowship or fixed-term researcher contracts at the University of Bologna 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.

State employees may on unpaid leave for the entire duration of the contract, thus occupying a non-tenure position without pay or social security contributions, in cases where such a position is allowed by the structure of origin, likewise without pay or social security contributions.

Art. 4 – Application procedure

The submission of the applications for participation in the selections must be made exclusively via electronic procedure by accessing the following link:

<https://personale.unibo.it>

Regarding all procedures, the deadline is the following: 30th December 2022 at 12:00 (noon, Italian Time).

The application must be submitted at the same time with the insertion of all the attached documentation required.

The following documents shall be enclosed to the electronic application form (preferably files: PDF, other supported files: JPG, BMP, PNG):

1. identification document scanned (10MB max);
2. curriculum vitae with indication of the scientific-professional activity (10MB max);
3. reference letters, if any. Letters can be submitted directly by the candidate uploading it during the application, in case of possession (10MB max), or can be submitted by the referee. In this case candidates should provide the referee e-mail address. When the application is closed, the system will send an automatic request to the referee, referring to the candidate and the procedure. The referee must submit his letter through the link into the e-mail. At this address he/she will upload his/her letter by the application deadline in order to be considered as part of the candidate's application.
4. scientific publications (other supported files are TIFF and PS, 20MB max each document) which are already printed at the date of the call of application deadline, or scientific publications accepted for printed, together with the editor acceptance letter. While uploading each document will be asked to indicate the title, the authors' names, the editor, the year of publication. Optional information are the month, the ISBN code, the DOI code, the booklet number.

Pursuant to Ministerial Decree 243/11, the PhD thesis is considered a publication, and thus if presented by the candidate it shall be included in the maximum number of publications indicated in each attachment.

While applying, applicants shall declare under their own responsibility:

1. surname and name;
2. place and date of birth;
3. citizenship;
4. residence address;

5. (if Italian citizens) registration to electoral rolls. If any, the reasons why he/she is not registered or cancelled from them;
6. that there have not been any criminal proceeding against them or current criminal proceedings; otherwise, applicants shall specify the proceedings against them (the date of the measure and the judicial authority that issued it) and pending penal proceedings. The existence of a previous criminal conviction is not in itself an impediment to hiring, unless it is a conviction for a crime that prevents the establishment of the employment relationship with the public administration as it derives from the interdiction from public office, or the inability to contract with the public administration, or the termination of the employment relationship (articles 28, 29, 32-ter, 32-quater, 32-quinquies of the Criminal Code, articles 3,4, 5, L. 97 of March 27, 2001). In other cases, the Administration will ascertain the gravity of the criminally relevant facts committed by the person concerned, for the purposes of access to public employment. This check is carried out with the aim of ascertaining the existence of the fiduciary element which constitutes the fundamental prerequisite of the relationship between employer and worker, as well as for the purpose of assessing the existence of the requisites of moral suitability and aptitude to carry out activities as a public employee;
7. to have or not to have benefited of non-voluntary leave periods due to maternity/paternity compulsory abstention or for serious health reasons, indicating the periods in case
8. possession of the qualification required pursuant to Art. 3 of this call for application and the mark obtained, if any;
9. to be fit to the employment the selection refers to;
10. that they are not, nor have been, professors, associate professors or researchers with tenure, even if not in service;
11. that they are not related by blood up to the fourth degree, to any professor working in the Department that proposed the activation of the single contract, or to the Rector, Director General or a member of the Board of Governors of the University of Bologna;
12. elected e-mail address for the purpose of the participation in this contest;
13. Foreign citizens shall also declare to have a proper knowledge of Italian and to enjoy civil and political rights also in their origin countries or the reasons for loss of enjoyment.

Any modification shall be timely communicated to the Ufficio Ricercatori a tempo determinato.

In case of technical problems, contact the support: assistenza.cesia@unibo.it.

Art. 5 – Applicants' obligations

The penalty of exclusion from the selection shall apply in the following cases:

- Non compliance with the terms and procedures for submitting the application form indicated in article 4 of this call for applications;

- Lack of the qualification required to participate in the selection indicated in each attachment.

All applicants shall be admitted to the contest and the Administration reserves the right to check that they actually are in possession of the requirements necessary to apply for the selections; the Administration may, at any time and even after the exams, order the exclusion from the selection hereto.

Art. 6 – Selection Board

With regard to each procedure, the Selection Board will be appointed upon administration resolution and is composed of three full or associate professors belonging to the competition Scientific sector or, alternatively, to the same competition macro-sector for which the procedure is announced or of equivalent role in the case of components not coming from national universities, identified by the Department that proposed the activation of the contract.

Two of the members, external to the University, are drawn with the methods provided by the art. 8-bis of the "Regolamento per la disciplina delle chiamate dei Professori di Prima e Seconda fascia" in application of articles 18 and 24 of the Law 240/2010 issued with DR 977/2013 and s.m. A third component is identified by the Department Council among the professors inside or outside the University. As envisaged by art. 57 of Legislative Decree 165/2001, in order to guarantee equal opportunities between men and women for the access to work and work treatment, generally, at least one member is female.

The Commission appoints a president and a recording secretary between their members. Notice of the appointment of each Commission will be published on Alma Mater Studiorum - University of Bologna website.

Art. 7 – Selection procedure

With regard to each procedure, the selection procedure is carried out by the Board after a preliminary evaluation of each candidate's qualifications, curriculum and scientific production, including the doctoral thesis, according to the criterion identified by the MUIR in D.M. 243/2011.

The candidates chosen in the preliminary evaluation based on their comparative merits - between 10 and 20% of the number of applicants and not less than 6 - will then be called for interview. The interview will consist of a discussion of the candidate's qualifications and scientific production and may take the form of a seminar open to the public. If the total number of candidates is 6 or less all candidates will be interviewed.

Any reference letters produced by the candidates will also be considered.

The discussion will take place in the language indicated in each attachment.

With regard to each procedure, the discussion with the Commission will take place starting from 23rd January 2023, and it will be carried out in public form and electronically using the audio and video teleconferencing tool via the Teams platform (the workstation from which candidates will take do the interview must be equipped with a webcam - essential for the recognition of the candidate - microphone and headphones and/or audio speakers),

according with the legislative and regulatory provisions regarding the containment and management of the epidemiological emergency from COVID-19 and also considering the evolution of the health emergency.

With reference to each procedure, the notice of the day and time in which the public discussion will take place will be announced together with the publication of the list of admitted candidates on the University website at: <https://bandi.unibo.it/docenti/rtd>.

The publication on the University website will constitute official notification to all applicants, without any obligation for any further communication.

The publication will be communicated by e-mail to the address indicated by the candidates in the application.

The Alma Mater Studiorum - University of Bologna does not assume any responsibility for the non-receipt or the not-read of the e-mail.

It is up to candidates to keep themselves informed by consulting the University website page to find necessary information about selection.

Candidates attending the interview must bring a valid identification document with them.

EU citizens shall bring their passport or an identity document issued by their country of origin. Non-EU citizens shall bring their passport.

Art. 8 – Individuation of the winner and recruitment

With regard to each procedure, after the exams, the Board proceeds to identify the winner. On equal merits, priority will be defined according to the date of birth and the youngest one shall precede.

In the event that a procedure is announced for two or more positions and for two or more research projects or separate locations are envisaged, the winning candidate who obtained the highest score will have the right to choose the research project to be developed or the location (in the event that the project is unique, but there are two or more locations). The winning candidate who obtained the highest overall score after the first winner have to choose between the remaining projects or locations, and so on up to the last winning candidate, whom will be assigned the remaining project or location.

In case of the winner's withdrawal, the candidate who obtained the highest overall score after the winner will be called.

The procedure's acts are approved pursuant to an administration resolution and will be published in Alma Mater Studiorum – University of Bologna Official Bulletin.

The terms to raise any appeal shall start from the date of publication of the forementioned notice, in case the resolution has not been otherwise disclosed.

The Department that activated the single position will propose recruitment by a majority vote of the professors and associate professors of the Department and approved by the Board of Governors. The Department will also propose the start date of the employment relationship.

Art. 9 – Employment procedures

Following the conclusion of the recruitment procedure referred to in art. 9, the candidates will be asked to sign a fixed-term contract of full-time or defined-time employment.

The employment relationship is governed by a personal contract, statutory laws and EC regulations.

In the event that the research project is in the medical field and provides for the performance of medical activity, the latter is governed by the national collective agreement for medical staff and by the specific appointment conferred by the hospital facility where the researcher will carry out the activity.

The personal contract shall specify any reasons for which it might be terminated, as well as the relevant periods of notice. In any case the contract will be terminated immediately and without notice in the event of the cancellation of the recruitment procedure to which it is inalienably linked.

The trial period shall last three months. At the end of the period, unless the employment relationship has been terminated by either of the parties, the employee is confirmed for service and the whole period worked from the beginning of the contract shall be calculated for seniority purposes.

Art. 10 – Documentation required for the participation in the public selection and for hiring purposes

For the purposes of participation in the public selection, documents and qualifications in English, French, German and Spanish can be produced in the language of origin. Documents and qualifications written in other languages must be presented in the original language with an Italian or English translation attached. The translation must be true and correct, written by an Italian consular, a qualified diplomatic representative, or an official translator.

Regarding the documentation necessary for hiring purposes, all the documents written in any foreign language shall be accompanied by a true and correct translation into Italian, written by an Italian consular, a qualified diplomatic representative, or an official translator.

Art. 11 – Rights and duties of a researcher with a fixed-term contract of employment

In accordance with the rights and duties of public employees prescribed by the Italian civil code, on signing the contract the researcher will be expected to perform all those activities mentioned for each position in the relative attachment as well as to carry out the research periods in the company and abroad (the latter only where applicable).

In the event that medical assistance services are provided, the researcher will also assume rights and duties related to this activity.

These activities will be carried out in respect of the existing hierarchy and in coordination with existing programmes and research projects.

The researchers will perform the requested activities in person, substitution is not permitted. Existing Italian laws concerning maternity, injury and illness will be applied.

The researcher undertakes to fulfill the obligations of conduct prescribed by the code of conduct, issued by DPR 62/2013.

Art. 12 – Processing of personal data and person in charge for the contest

Information about the processing of personal data (provided during the application process) are available at the link: www.unibo.it/privacy (Notice for participants in contests and selections published by the University).

The person in charge of the contest is Mr. Gianfranco Raffaelli, Responsabile dell'Ufficio Ricercatori a tempo determinato - Piazza Verdi n. 3 - 40126 Bologna.

For further information, please contact: Ufficio Ricercatori a tempo determinato dell'Alma Mater Studiorum - Università di Bologna – Piazza Verdi n. 3 - Tel. +39 051 2099980 – 2098958 - 2098972, Fax 051 2086163; e-mail: apos.ricercatoritempodeterminato@unibo.it.

Art. 13 – Reference Regulations

The present notice is issued based on the following regulations:

- Art. 24 of Law no. 240 dated December 30th, 2010;
- D.P.R. (Decree of the President of the Republic) no. 445 dated December 28th, 2000;
- Leg. Decree no. 165 dated March 30th, 2001;
- Law 241/1990;
- Regulation for fixed-term researchers of Alma Mater Studiorum – University of Bologna, (link:

http://www.normateneo.unibo.it/NormAteneo/Regolamento_ricercatori_a_tempo_determinato.htm).

For the Director of Area del Personale
f.to digitalmente Giovanni Longo

Attached documents:

- Summary table of activated positions;
- Attachments:
 1. Academic Discipline Agr/01, 2 positions, Department Of Agricultural and Food Sciences - DISTAL;
 2. Academic Discipline Bio/08, 1 position, Department Of Biological, Geological, and Environmental Sciences - BiGeA;
 3. Academic Discipline Bio/09, 1 position, Department Of Biomedical and Neuromotor Sciences - DIBINEM;
 4. Academic Discipline Bio/10, 1 position, Department Of Pharmacy and Biotechnology - FaBiT;
 5. Academic Discipline Bio/19, 1 position, Department Of Pharmacy and Biotechnology - FaBiT;
 6. Academic Discipline Chim/01, 1 position, Department Of Industrial Chemistry "Toso Montanari" -CHIMIND;
 7. Academic Discipline Chim/02, 2 positions, Department Of Chemistry "Giacomo Ciamician" - CHIM;
 8. Academic Discipline Chim/03, 2 positions, Department Of Chemistry "Giacomo Ciamician" - CHIM;
 9. Academic Discipline Chim/03, 1 position, Department Of Agricultural and Food Sciences - DISTAL;
 10. Academic Discipline Chim/04, 1 position, Department Of Industrial Chemistry "Toso Montanari" - CHIMIND;
 11. Academic Discipline Chim/06, 1 position, Department Of Chemistry "Giacomo Ciamician" - CHIM;
 12. Academic Discipline Chim/11, 1 position, Department Of Medical and Surgical Sciences - DIMEC;
 13. Academic Discipline Fis/01, 1 position, Department Of Physics and Astronomy "Augusto Righi" - DIFA;
 14. Academic Discipline Fis/03, 1 position, Department Of Medical and Surgical Sciences - DIMEC;
 15. Academic Discipline Geo/05, 2 positions, Departments Of Civil, Chemical, Environmental, and Materials Engineering - DICAM; Department Of Biological, Geological, and Environmental Sciences - BiGeA;
 16. Academic Discipline Icar/01, 1 position, Department Of Civil, Chemical, Environmental, and Materials Engineering - DICAM;
 17. Academic Discipline Inf/01, 9 positions, Department Of the Arts -DAR; Department of Computer Science and Engineering – DISI; Department of Classical Philology and Italian Studies - FICLIT; Department of Modern Languages, Literatures, and Cultures - LILEC;

18. Academic Discipline Ing-Inf/02, 1 position, Department Of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI;
19. Academic Discipline Ing-Inf/04, 1 position, Department Of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI;
20. Academic Discipline Ing-Inf/05, 6 positions, Department Of Computer Science and Engineering - DISI;
21. Academic Discipline Ing-Inf/06, 1 position, Department Of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI;
22. Academic Discipline Ius/07, 1 position, Department Of Sociology and Business Law - SDE;
23. Academic Discipline L-Art/02, 1 position, Department Of the Arts - DAR;
24. Academic Discipline L-Lin/12, 2 positions, Department Of Interpreting and Translation - DIT;
25. Academic Discipline Mat/05, 1 position, Department Of Mathematics - MAT;
26. Academic Discipline Mat/07, 2 positions, Department Of Mathematics - MAT;
27. Academic Discipline Mat/08, 1 position, Department Of Mathematics - MAT;
28. Academic Discipline Mat/08, 1 position, Department Of Mathematics - MAT;
29. Academic Discipline M-Dea/01, 1 position, Department Of History and Cultures - DiSci;
30. Academic Discipline Med/03, 3 positions, Department Of Biomedical and Neuromotor Sciences - DIBINEM; Department Of Medical and Surgical Sciences – DIMEC;
31. Academic Discipline Med/04, 3 positions, Department Of Experimental, Diagnostic and Specialty Medicine - DIMES;
32. Academic Discipline M-Ped/01, 1 position, Department Of Education Studies "Giovanni Maria Bertin" - EDU;
33. Academic Discipline M-Psi/01, 1 position, Department Of Philosophy and Communication Studies - FILCOM;
34. Academic Discipline M-Sto/04, 1 position, Department Of the Arts - DAR;
35. Academic Discipline M-Sto/04, 1 position, Department Of History and Cultures - DiSci;
36. Academic Discipline Secs-P/07, 1 position, Department Of Management - DiSA;
37. Academic Discipline Secs-P/08, 1 position, Department Of Management - DiSA;
38. Academic Discipline Secs-P/09, 1 position, Department Of Management - DiSA;
39. Academic Discipline Sps/07, 1 position, Department Of Sociology and Business Law - SDE;
40. Academic Discipline Sps/08, 1 position, Department Of Political and Social Sciences - SPS;
41. Academic Discipline Secs-p/01, 3 positions, Department of Economics – DSE.

TABELLA RIEPILOGATIVA DELLE POSIZIONI ATTIVATE								
Department	Call	CUP	Project	Project Code	Academic Recruitment Field	Academic Discipline	nr. Positions	Campus
Agricultural and Food Sciences - DISTAL	PE	J33C22002860001	PE10 - ONFOOD	PE0000003	07/A1 - agricultural Economics and appraisal	AGR/01 - Agricultural Economics and Rural Appraisal	2	Bologna
Biological, Geological, and Environmental Sciences - BiGeA	PE	J33C22002850006	PE5 - CHANGES	PE0000020	05/B1 - Zoology and Anthropology	BIO/08 - Anthropology	1	Bologna
Biomedical and Neuromotor Sciences - DIBINEM	PE	J33C22002970002	PE12 - MNESYS	PE0000006	05/D1 - Physiology	BIO/09 - Physiology	1	Bologna
Pharmacy and Biotechnology -FaBiT	PE	J33C22002920006	PE6 - HEAL ITALIA	PE0000019	05/E1 - General Biochemistry	BIO/10 - Biochemistry	1	Bologna
Pharmacy and Biotechnology -FaBiT	PE	J33C22002870005	PE13 - INF-ACT	PE0000007	05/I2 - Microbiology	BIO/19 - Microbiology	1	Bologna
Industrial Chemistry "Toso Montanari" -CHIMIND	PE	J33C22002890007	PE2 - NEST	PE0000021	03/A1 - Analytical Chemistry	CHIM/01 - Analytical Chemistry	1	Bologna
Chemistry "Giacomo Ciamician" - CHIM	CN	J33C22001170001	HPC	CN0000013	03/A2 - Models and Methods For Chemistry	CHIM/02 - Physical Chemistry	2	Bologna
Chemistry "Giacomo Ciamician" - CHIM	CN	J33C22001120001	MOBILITY	CN0000023	03/B1 - Principles of Chemistry and Inorganic Systems	CHIM/03 - General and Inorganic Chemistry	2	Ravenna, Rimini
Agricultural and Food Sciences - DISTAL	PE	J33C22002860001	PE10 - ONFOOD	PE0000003	03/B1 - Principles of Chemistry and Inorganic Systems	CHIM/03 - General and Inorganic Chemistry	1	Cesena
Industrial Chemistry "Toso Montanari" -CHIMIND	PE	J33C22002890007	PE2 - NEST	PE0000021	03/C2 - Industrial and Applied Chemistry	CHIM/04 - Industrial Chemistry	1	Bologna
Chemistry "Giacomo Ciamician" - CHIM	CN	J33C22001140001	mRNA	CN0000041	03/C1 - Organic Chemistry	CHIM/06 - Organic Chemistry	1	Bologna
Medical and Surgical Sciences - DIMEC	PE	J33C22002860001	PE10 - ONFOOD	PE0000003	03/D1 - Medicinal, Toxicological and Nutritional Chemistry and Applied Technologies	CHIM/11 - Chemistry and Biotechnology of Fermentation	1	Bologna
Physics and Astronomy "Augusto Righi" - DIFA	PE	J33C22002830006	PE1 - FAIR	PE0000013	02/A1 - Experimental Physics of Fundamental Interactions	FIS/01 - Experimental Physics	1	Bologna
Medical and Surgical Sciences - DIMEC	PE	J33C22002840002	PE3 - RETURN	PE0000005	02/B1 - Experimental Physics of Matter	FIS/03 - Physics of Matter	1	Bologna
1) Civil, Chemical, Environmental, and Materials Engineering - DICAM; 2) Biological, Geological, and Environmental Sciences - BiGeA	PE	J33C22002840002	PE3 - RETURN	PE0000005	04/A3 - Engineering Geology, Physical Geography and Geomorphology	GEO/05 - Engineering Geology	2	Bologna
Civil, Chemical, Environmental, and Materials Engineering - DICAM	PE	J33C22002840002	PE3 - RETURN	PE0000005	08/A1 - Hydraulics, Hydrology, Hydraulic and Marine Constructions	ICAR/01 - Hydraulics	1	Bologna
1) Dep. Of the Arts - DAR; 2) Computer Science and Engineering - DISI; 3) Classical Philology and Italian Studies - FICLIT; 4) Modern Languages, Literatures, and Cultures - LILEC	PE	J33C22002950001	PE11 - 3A-ITALY	PE0000004	01/B1 - Informatics	INF/01 - Informatics	9	Bologna, Cesena, Rimini

Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI	PE	J33C22002880001	PE14 - RESTART	PE0000001	09/F1 - Electromagnetic Fields	ING-INF/02 - Electromagnetic Fields	1	Bologna
Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI	PE	J33C22002950001	PE11 - 3A-ITALY	PE0000004	09/G1 - Systems and Control Engineering	ING-INF/04 - Systems and Control Engineering	1	Bologna
Computer Science and Engineering - DISI	PE	J33C22002830006	PE1 - FAIR	PE0000013	09/H1 - Information Processing Systems	ING-INF/05 - Information Processing Systems	6	Bologna, Cesena
Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI	PE	J33C22002920006	PE6 - HEAL ITALIA	PE0000019	09/G2 - Bioengineering	ING-INF/06 - Electronic and Informatics Bioengineering	1	Cesena
Sociology and Business Law -SDE	PE	J33C22002910001	PE9 - GRINS	PE0000018	12/B2 - Labour Law	IUS/07 - Labour Law	1	Forlì
the Arts -DAR	PE	J33C22002850006	PE5 - CHANGES	PE0000020	10/B1 - Art History	L-ART/02 - History of Modern Art	1	Bologna
Interpreting and Translation - DIT	PE	J33C22002850006	PE5 - CHANGES	PE0000020	10/L1 - English and Anglo-American Languages, Literatures and Cultures	L-LIN/12 - Language and Translation - English	2	Forlì
Mathematics - MAT	PE	J33C22002970002	PE12 - MNESYS	PE0000006	01/A3 - Mathematical Analysis, Probability and Statistics	MAT/05 - Mathematical Analysis	1	Bologna
Mathematics - MAT	PE	J33C22002830006	PE1 - FAIR	PE0000013	01/A4 - Mathematical Physics	MAT/07 - Mathematical Physics	2	Bologna
Mathematics - MAT	PE	J33C22002830006	PE1 - FAIR	PE0000013	01/A5 - Numerical Analysis	MAT/08 - Numerical Analysis	1	Bologna
Mathematics - MAT	PE	J33C22002950001	PE11 - 3A-ITALY	PE0000004	01/A5 - Numerical Analysis	MAT/08 - Numerical Analysis	1	Ravenna
History and Cultures -DiSci	PE	J33C22002850006	PE5 - CHANGES	PE0000020	11/A5 - Demography, Ethnography and Anthropology	M-DEA/01 - Demology, Ethnology and Anthropology	1	Bologna
1) Biomedical and Neuromotor Sciences - DIBINEM; 2) Medical and Surgical Sciences - DIMEC	PE	J33C22002970002	PE12 - MNESYS	PE0000006	06/A1 - Medical Genetics	MED/03 - Medical Genetics	3	Bologna
Experimental, Diagnostic and Specialty Medicine - DIMES	PE	J33C22002920006	PE6 - HEAL ITALIA	PE0000019	06/A2 - Experimental Medicine, Pathophysiology and Clinical Pathology	MED/04 - Experimental Medicine and Pathophysiology	3	Bologna
Education Studies "Giovanni Maria Bertin" -EDU	PE	J33C22002860001	PE10 - ONFOOD	PE0000003	11/D1 - Educational Theories and History of Educational Theories	M-PED/01 - Pedagogy, Theories of Education and Social Education	1	Bologna
Philosophy and Communication Studies -FILCOM	PE	J33C22002830006	PE1 - FAIR	PE0000013	11/E1 - General Psychology, Psychobiology and Psychometrics	M-PSI/01 - General Psychology	1	Bologna
the Arts -DAR	PE	J33C22002850006	PE5 - CHANGES	PE0000020	11/A3 - Contemporary History	M-STO/04 - Contemporary History	1	Bologna
History and Cultures -DiSci	PE	J33C22002850006	PE5 - CHANGES	PE0000020	11/A3 - Contemporary History	M-STO/04 - Contemporary History	1	Bologna
Management -DiSA	PE	J33C22002910001	PE9 - GRINS	PE0000018	13/B1 - Business Administration and Accounting Studies	SECS-P/07 - Business Administration and Accounting Studies	1	Forlì
Management -DiSA	PE	J33C22002910001	PE9 - GRINS	PE0000018	13/B2 - Management	SECS-P/08 - Management	1	Bologna
Management -DiSA	PE	J33C22002910001	PE9 - GRINS	PE0000018	13/B4 - Financial Markets, Financial Institutions, and Corporate Finance	SECS-P/09 - Corporate Finance	1	Bologna

Sociology and Business Law -SDE	PE	J33C22002910001	PE9 - GRINS	PE0000018	14/C1 - General Sociology	SPS/07 - General Sociology	1	Forli
Political and Social Sciences - SPS	PE	J33C22002910001	PE9 - GRINS	PE0000018	14/C2 - Sociology of Culture and Communication	SPS/08 - Sociology of Culture and Communication	1	Bologna
Economics - DSE	PE	J33C22002910001	PE9 - GRINS	PE0000018	13/A1 - Economics	SECS-P/01 - Economics	3	Bologna

ATTACHMENT 1

The specific elements of this procedure are as follows:

- **Departments:** Departments of Agricultural and Food Sciences - DISTAL
- **SC:** 07/A1 – Agricultural Economics and appraisal
- **SSD:** AGR/01 - Agricultural Economics and Rural Appraisal
- **Number of positions:** 2
- **Main place of employment:** Bologna
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** Economic evaluation and policies in innovative process for sustainability for agrifood systems
 - **Financial coverage:** PNRR Found – Call CN – Project AGRI, “National Research Centre for Agricultural Technologies” – Code CN00000022
 - **CUP:** J33C22001150008
 - **Project manager:** Davide Viaggi
 - **Brief description of the project:** The activities will concern: 1) study on the acceptability of new technologies in the agriculture and food sector by consumers and farmers; the activity can include carrying out surveys with consumers and farmers and related data analysis; 2) evaluation of new technologies and organisational solutions compared to traditional approaches; 3) study of policies and development of operational instruments (guidelines, monitoring instruments) for providing incentives to the diffusion of technologies and solutions oriented to the sustainability of agri-food systems. These studies could benefit of participatory activities based on stakeholder involvement and on the network of living labs connected with the project funded with PNRR resources.
 - **Objective of the research project:** 3 publications on Scopus-indexed journal, of which at least 1 on a journal of the in the first quartile according to Citescore. Participation in at least 5 (five) national and international conferences
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian or English based on the candidate’s choice
 - **Foreign language:** English

2) Project 2 – Title: Design, implementation and evaluation of behavioral interventions to nudge and manage the transition towards healthy and sustainable diets

- **Financial coverage:** PNRR Found – Call PE – Project PE10 – ONFOOD, "Research and innovation network on food and nutrition Sustainability, Safety and Security – Working ON Foods" – Codice PE0000003
- **CUP:** J33C22002860001
- **Project manager:** Matteo Vittuari
- **Brief description of the project:** Activities will include: 1) design, implementation and evaluation of behavioural interventions to stimulate and govern the transition towards healthy and sustainable diets in different settings (i.e., domestic consumption, collective catering); 2) measurement and analysis of food waste and identification of prevention and reduction interventions; 3) study of policies and development of operational tools (i.e., guidelines, measurement tools) to encourage the diffusion of solutions contributing to food systems sustainability by reducing food waste and promoting healthy diets. These studies will benefit of the engagement of stakeholders and of the relationship with the networks of living labs linked to the projects funded under the PNRR programme.
- **Objective of the research project:** 4 publications on Scopus-indexed journal, of which at least 1 on a journal of the in the first quartile according to Citescore. Participation in at least 3 (three) national and international conferences
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian or English based on the candidate's choice
- **Foreign language:** English

ATTACHMENT 2

The specific elements of this procedure are as follows:

- **Department:** Department of Biological, Geological, and Environmental Sciences - BiGeA
- **SC:** 05/B1 – Zoology and Anthropology
- **SSD:** BIO/08 – Anthropology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Code PE0000020
- **CUP:** J33C22002850006
- **Project manager:** Maria Giovanna Belcastro
- **Project title:** Anthropological research, conservation, and valorisation of human skeletal collections through virtual approaches
- **Duration of contract:** 36 months
- **Brief description of the project:** Activities foreseen in the declaratory of SSD BIO/08 (Anthropology), with particular reference to scientific and teaching activities in the field of the study of human skeletal collections through digital approaches to analyse their variability, paying attention to morpho-functional differences in ontogenetic, evolutionary and environmental adaptive frame. Innovative tools will be used to study, preserve, and enhance anthropological collections as natural and cultural heritage. Virtual databases will be created in order to share scientific data for anthropological research, whose results will be disseminated in museum context, developing third mission, and taking into account ethical aspects. The research project falls under the objectives of spoke 6 (History, Conservation and Restoration of Cultural Heritage) of Pe5 aimed at developing integrated approaches and methodologies for the valorisation of cultural heritage.
- **Objective of the research project:** Over the three-year period, the researcher's scientific productivity objectives are to publish at least 6 publications in international peer-reviewed journals, of which at least 3 as the lead author, in addition to the presentation of the obtained results at national and/or international scientific conferences. The researcher is also expected to play an active role in the conceptualization and writing of project proposals and to participate to national and international research projects.
- **Admission requirement:** PhD



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- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 3

The specific elements of this procedure are as follows:

- **Department:** Department of Biomedical and Neuromotor Sciences - DIBINEM
- **SC:** 05/D1 – Physiology
- **SSD:** BIO/09 – Physiology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 24
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE12 – MNESYS “A multiscale integrated approach to the study of the nervous system in health and disease” – Code PE000006
- **CUP:** J33C22002970002
- **Project manager:** Patrizia Fattori
- **Project title:** Neural networks: neurophysiology, neurotech of perception, movement and brain-body interactions
- **Duration of contract:** 36 months
- **Brief description of the project:** The researcher will characterize the neurophysiology of brain networks underlying sensorimotor functions and decode motor parameters from brain networks by machine learning techniques. The researcher will exploit the knowledge derived from neurophysiology towards tailored understanding of brain-body interactions in healthy and subclinical cohorts for development of therapeutical protocols. The project aims at studying these circuits in the human and non-human primate through behavioural and neurophysiological recordings. This research may be useful to restore lost functions in humans after cerebral damage of sensorimotor functions. The techniques to be used are: 1) behavioral and neural recordings during the execution of sensorimotor tasks by human and non-human primates and 2) use of these data to decode movement parameters to implement systems able to help patients also in sensorimotor contexts
- **Objective of the research project:** During the project the researcher must publish at least 3 articles in peer-reviewed journals and attend at least 2 national or international meetings relevant for the subject of the project
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 4

The specific elements of this procedure are as follows:

- **Department:** Department of Pharmacy and Biotechnology - FaBiT
- **SC:** 05/E1 – General Biochemistry
- **SSD:** BIO/10 – Biochemistry
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE6 – HEAL ITALIA “Health Extended Alliance For Innovative Therapies, Advanced Lab-Research, and Integrated Approaches of Precision Medicine”, Code PE0000019
- **CUP:** J33C22002920006
- **Project manager:** Anna Maria Porcelli
- **Project title:** Identification and analysis of adaptive responses in tumorigenesis processes associated with functional alterations of mitochondria.
- **Duration of contract:** 36 months
- **Brief description of the project:** Cancer cells must continuously change their metabolism to adapt to the microenvironment. This has led to the identification of some metabolic enzymes including mitochondrial respiration Complex I as possible targets for the development of new therapeutic opportunities. It has been shown that the severe impairment of the function of this complex is able to slow down but not induce the complete eradication of the tumor mass by activating potential adaptive mechanisms that could contribute to chemoresistance. The RTDa) activity will aim to develop a synthetic lethality approach through 1) the identification of adaptive responses and specific molecular targets using tumor models with genetically or pharmacologically induced mitochondrial dysfunctions; 2) the analysis of the effect of pharmacological inhibition of mitochondrial function and of the molecular targets identified in 3D tumor epithelial models.
- **Objective of the research project:** over the 36 months of the contract, the objectives related to the scientific productivity are: 1) production of at least two original full-length publications in international "peer-reviewed" journals; 2) communication of the obtained results and participation to at least three international and/or national congresses; 3) participation in activities of the PE6 and in international or national project activities connected to it, contributing to the achievement of the deliverables; 4) training of young scientists on topics

coherent with the objectives of PE6 with the supervision of bachelor's Degree, master's Degree and PhD theses, as co-tutor/tutor.

- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 5

The specific elements of this procedure are as follows:

- **Department:** Department of Pharmacy and Biotechnology - FaBiT
- **SC:** 05/12 – Microbiology
- **SSD:** BIO/19 – Microbiology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 24
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE13 - INF-ACT "One Health Basic and Translational Research Actions addressing Unmet Needs on Emerging Infectious Diseases", Codice PE0000007
- **CUP:** J33C22002870005
- **Project manager:** Marco Rinaldo Oggioni
- **Project title:** Preclinical translational models and studies of microorganism, human and environmental correlation.
- **Duration of contract:** 36 months
- **Brief description of the project:** The activity of the researcher will aim to investigate antimicrobial drug resistance (AMR)-related issues involving jointly microbial, human, and environmental factors contributing to bacterial evolution and AMR spread. The work will embrace (1) the characterisation of the crosstalk between virulence and AMR at the bacterium-host interface including work in in vivo experimental infection models and (2) the evaluation of the parameters in translational infection models, including work on human organs. The overall aim will be to target cellular aspects to minimise the impact of AMR.
- **Objective of the research project:** The target of scientific productivity is the publication of one paper per year which can be scored "A" in the VQR (Research Quality Evaluation by the National Agency for Research and University Evaluation).
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 6

The specific elements of this procedure are as follows:

- **Department:** Department of Industrial Chemistry "Toso Montanari" - CHIMIND
- **SC:** 03/A1 – Analytical Chemistry
- **SSD:** CHIM/01 – Analytical Chemistry
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 57
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE2 – NEST, “Network 4 energy sustainable transition” – Code PE0000021
- **CUP:** J33C22002890007
- **Project manager:** Erika Scavetta
- **Project title:** Synthesis and characterization of functional materials for energy applications
- **Duration of contract:** 36 months
- **Brief description of the project:** The research project will be aimed at the preparation of thin films of inorganic as well as polymeric materials and nanomaterials to be used in the energy field, for the transformation/production and for the monitoring of molecules of interest. The thin films could be prepared by electrochemical deposition or by inkjet printing. Electrochemical deposition allows to obtain in a single step thin and well adherent films of functional materials on conductive surfaces. Inkjet printing, on the other hand, allows the deposition of a wide range of materials on supports of different nature, with a high control over the amount of material deposited per area and the possibility of creating microstructured patterns constituting a low-cost method for large-scale production. The project also envisages the use of analytical techniques and in particular of electrochemical methods for the characterization of the synthesized materials and films.
- **Objective of the research project:** The requirements of scientific productivity will be the publication of at least 6 papers on international peer-reviewed journals on the topics of the research activity and fully coherent with the scientific sector CHIM/01. The presentation of contributions to at least 3 (national or international) conferences is also required.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 7

The specific elements of this procedure are as follows:

- **Department:** Department of Chemistry "Giacomo Ciamician" - CHIM
- **SC:** 03/A2 - Models and Methods For Chemistry
- **SSD:** CHIM/02 - Physical Chemistry
- **Number of positions:** 2
- **Main place of employment:** Bologna
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** Development and application of interpretative models for the chemistry of the interstellar medium
 - **Number of hours of frontal teaching per year:** 32
 - **Financial coverage:** PNRR Found – Call CN – Project HPC “National Centre for HPC, Big Data and Quantum Computing” – Code CN00000013
 - **CUP:** J33C22001170001
 - **Project manager:** Cristina Puzzarini
 - **Brief description of the project:** The research activity will be carried out in the fields of computational chemistry and rotational spectroscopy applied to astrochemistry. The research project is developed in the field of astrochemistry and aims at the chemical characterization of a molecular cloud (a clump of gas and dust that will lead to a new solar system) in the interstellar medium. This project requires the simulation of the rotational spectra of all molecular species possibly present in the cloud to be compared with the corresponding radioastronomical spectrum (hundreds of molecules), the derivation of a chemical network connecting all identified species (thousands of reactions to be characterized thermochemically and kinetically), and the modeling of their abundance over time (time scale: 10 – 106 years). Therefore, the project requires the development and the application of dedicated computer programs that exploit massively parallel high-performance computing infrastructures.

- **Objective of the research project:** The scientific research should be finalized to obtain a high-level academic profile, which should be characterized by publications in international journals with high impact factor. The goals of the research productivity can be identified in obtaining within the end of the 3-year period, at least, 10 publications (printed or in press) in international journals with high impact factor. Furthermore, the results of the research activity should be presented as oral communications at, at least, 3 international conferences during the 3-year period.
- 2) **Project 2 – Title:** Optimization of materials and processes to improve sustainability and performance of energy storage/conversion systems
- **Number of hours of frontal teaching per year:** 60
 - **Financial coverage:** PNRR Found – Call PE - PE2 – Project NEST “Network 4 energy sustainable transition” – Code PE0000021
 - **CUP:** J33C22002890007
 - **Project manager:** Catia Arbizzani
 - **Brief description of the project:** The activities will cover electrochemical energy storage and conversion systems. A cutting-edge research, from concept to product, will be developed, improving energy performances, sustainability, durability, reducing costs and ensuring high quality and safety. Generations 3, 4 and above 4 of Li-based batteries will be addressed. Optimization of established technologies is also planned.
 - **Objective of the research project:** The researcher will contribute to the development of the sustainable electrochemical cells for energy storage/conversion. This original contribution will lead to patent filing and therefore to the creation of industrial property rights owned by the University of Bologna, and/or to publications in qualified editorial journals. It is expected to publish at least three scientific papers in Scopus indexed, international journals with IF > 4

ATTACHMENT 8

The specific elements of this procedure are as follows:

- **Departments:** Departments of Chemistry "Giacomo Ciamician" - CHIM
- **SC:** 03/B1 - Principles of Chemistry and Inorganic Systems
- **SSD:** CHIM/03 - General and Inorganic Chemistry
- **Number of positions:** 2
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** Development of materials and production and recovery processes of current and next-generation electrochemical energy storage/conversion cells of improved performance and sustainability
 - **Financial coverage:** PNRR Found – Call CN – Project MOBILITY, “Sustainable Mobility Center (Centro Nazionale per la Mobilità Sostenibile)” – Codice CN00000023
 - **CUP:** J33C22001120001
 - **Main place of employment:** Ravenna
 - **Number of hours of frontal teaching per year:** 56
 - **Project manager:** Francesca Soavi
 - **Brief description of the project:** Development of high-power cells through three main strategies, which will be conducted with attention to the sustainability of materials and processes: a) development of lithium and post-lithium cell materials operating at high C-rates (electrodes, separators, electrolytes, stable at high operating temperatures typical of power applications), b) development of alternative electrode materials characterized by high process kinetics (including capacitive systems such as lithium-ion capacitors, hybrid supercapacitors) and their integration, c) analysis and diagnosis (ex-situ, in-situ and in-operando) of materials and cells under high power operation using advanced techniques. Technology transfer of the project results through collaborations with industrial partners and/or spin-offs.
 - **Objective of the research project:** The researcher will contribute to the development of the sustainable manufacturing, re-use and recycling of high-performance electrochemical cells for energy storage/conversion. This original contribution will lead to patent filing and therefore to the creation of industrial property rights owned by the University of Bologna, and/or to publications in qualified editorial journals. It is expected to publish at least three scientific papers in Scopus indexed, international journals with IF > 4

- **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 2) **Project 2 – Title:** Light-based production of inorganic materials
- **Financial coverage:** PNRR Found – Call PE – Project PE2 – NEST, “Network 4 energy sustainable transition” – Code PE0000021
 - **CUP:** J33C22002890007
 - **Main place of employment:** Rimini
 - **Number of hours of frontal teaching per year:** 24
 - **Project manager:** Marco Montalti
 - **Brief description of the project:** The research activity will involve the development of new processes for patterning inorganic materials using a focused light beam. In the framework of an Energy Sustainable Transition these processes will allow to: i) convert light energy into chemical energy, ii) produce materials with reduced energy consumption, iii) produce new materials for energy conversion. The processes will be based on the production of local changes of chemical properties (e.g. pH) of a precursor solution because of the localized action of light on specific molecules. The activity will hence require the identification of suitable photo-active molecules and the investigation of the effect of the illumination of the local chemical properties. In a second stage the process will be optimized in order to induce the local production of inorganic material in the specific irradiated volume. Finally, the processes will be optimized to pattern specific shapes. The main advantage of the processes studied in the project is to provide energy, and in particular light, in a very localized way in order to minimize the energy waste.
 - **Objective of the research project:** The researcher will contribute to the development of new light-based processes for the production and patterning of inorganic materials that allow to minimize the energy cost for fabrication. This original contribution will lead to the publication of at least three scientific papers in Scopus indexed, international journals with IF > 4.
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English

ATTACHMENT 9

The specific elements of this procedure are as follows:

- **Department:** Department of Agricultural and Food Sciences - DISTAL
- **SC:** 03/B1 – Principles of Chemistry and Inorganic Systems
- **SSD:** CHIM/03 – General and Inorganic Chemistry
- **Number of positions:** 1
- **Main place of employment:** Cesena
- **Number of hours of frontal teaching per year:** 0
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE10 – ONFOOD, "Research and innovation network on food and nutrition Sustainability, Safety and Security – Working ON Foods", Code PE0000003
- **CUP:** J33C22002860001
- **Project manager:** Francesco Capozzi
- **Project title:** Study of chemical processes, both at the microscopic and macroscopic level, and of the structure-property relationships, inherent to the impact of food on human health, by means of nuclear magnetic resonance and artificial intelligence methods.
- **Duration of contract:** 36 months
- **Brief description of the project:** The RTD will carry out activities related to the acquisition of molecular and supramolecular data by means of nuclear magnetic resonance, both by spectroscopy and by relaxometry in the time domain, necessary to define the chemical state of the food matter and of the biological systems affected by compartmentalized transformations relevant for the nutritional aspects. The research will be focused on the definition of the kinetic aspects of perturbations with respect to equilibrium states, on the micro- and macro-scale, from the subcellular components up to entire superorganisms. To this end, the RTD will develop models for the description and simulation of chemical exchanges using artificial intelligence tools (machine and deep learning) that allow to define and explain complex patterns of molecular networks, also through the identification of biomarkers.
- **Objective of the research project:** At least 5 articles in ISI / Scopus indexed journals, in Q1 of the relevant sector, of which at least 2 as first or last author; presentation as speaker of at least 2 oral communications at congresses (in presence or online); creation of 1 database for the collection of omics data acquired by nuclear magnetic resonance; participation in at least 1 competitive project.



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- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 10

The specific elements of this procedure are as follows:

- **Department:** Department of Industrial Chemistry "Toso Montanari" - CHIMIND
- **SC:** 03/C2 – Industrial and Applied Chemistry
- **SSD:** CHIM/04 – Industrial Chemistry
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE2 – NEST, “Network 4 energy sustainable transition” – Codice PE000021
- **CUP:** J33C22002890007
- **Project manager:** Francesco Basile
- **Project title:** Development of chemical processes and catalytic technologies for the production of hydrogen, energy vectors and the carbon neutrality
- **Duration of contract:** 36 months
- **Brief description of the project:** The RTD will be engaged in activities related to industrial chemistry and more precisely to the development of chemical processes and catalytic technologies for the production of hydrogen, energy carriers and for the use of renewable and biogenic raw materials oriented towards climate neutrality. The experimental activity will be devoted to the study of catalysts in laboratory reactors and bench scale, to the definition of the reactivity characteristics of the catalysts, to the optimization of operating conditions with the aim of minimizing costs, impact on critical raw materials and climate impact. The researcher will develop research and innovation activities in close contact with industry using the approaches of industrial chemistry and specifically the development of chemical processes, the synthesis of catalysts and the study of catalytic processes in order to define the link between structure and reactivity.
- **Objective of the research project:** The researcher will be required to be involved in 6 publications in international journals, in the reference topics described in the research activity, and 3 conference presentations, of which at least one should be within international meetings. Participation in research and development activities in national, international or commercial projects is envisaged.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 11

The specific elements of this procedure are as follows:

- **Department:** Department of Chemistry "Giacomo Ciamician" - CHIM
- **SC:** 03/C1 - Organic Chemistry
- **SSD:** CHIM/06 - Organic Chemistry
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR Found – CN – mRNA “National Center for Gene Therapy and Drugs based on RNA Technology”, Code CN00000041
- **CUP:** J33C22001140001
- **Project manager:** Walter Cabri
- **Project title:** Development of new RNA-targeting compounds RIBOTAC and Stereopure Oligonucleotides and peptide conjugates
- **Duration of contract:** 36 months
- **Brief description of the project:** The project involves the development and optimization of iterative protocols for the synthesis of oligopeptides, oligonucleotides and their conjugates aiming at the design, preparation and purification of bioactive molecules. The project will accomplish the European and national guidelines related to the design of sustainable products and processes, by taking advantage of already available green chemistry techniques and by developing new approaches with low environmental impact. High molecular weight molecules, prepared within these activities, will also require purification through sustainable and environmentally friendly chromatographic techniques.
- **Objective of the research project:** The research activity goal will be the achievement of a high academic profile that will include the publication of articles in international journals of excellence. The scientific productivity objectives to be achieved at the end of the three-year period include the publication (or in the process of being published, by presenting suitable documentation) of at least 6 papers on international journals with a high impact factor. Moreover, the results of the research activity will be presented in oral presentations or posters during, at least, 4 national or international conferences. The researcher will also have an active role in research projects, to be developed in collaboration with all the colleagues of the department.



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- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 12

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 03/D1 – Medicinal, Toxicological and Nutritional Chemistry and Applied Technologies
- **SSD:** CHIM/11 – Chemistry and Biotechnology of Fermentation
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 20
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE10 – ONFOOD, "Research and innovation network on food and nutrition Sustainability, Safety and Security – Working ON Foods", Code PE0000003
- **CUP:** J33C22002860001
- **Project manager:** Patrizia Brigidi
- **Project title:** Role of the gut microbiome in metabolic disorders and modulatory effect of the diet
- **Duration of contract:** 36 months
- **Brief description of the project:** The research activity will focus on the characterization of the composition and functionality of the gut microbiome in subjects of different ages, suffering from chronic non-communicable diseases, specifically metabolic diseases such as obesity, metabolic syndrome and type II diabetes, in order to determine the role of the microbiome in the onset and progression of such disorders. In addition, the impact of the diet will be evaluated, in particular how specific nutritional approaches can modulate dysbiotic states of the gut microbiome for preventive and therapeutic purposes. The research activity will mainly involve the use of multi-omics approaches, such as 16S rRNA gene sequencing, shotgun metagenomics, metatranscriptomics and metabolomics.
- **Objective of the research project:** During the project the researcher must publish at least 6 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project.
- **Admission requirement:** PhD
- **Maximum number of publications:** 20
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 13

The specific elements of this procedure are as follows:

- **Department:** Department of Physics and Astronomy "Augusto Righi" - DIFA
- **SC:** 02/A1 – Experimental Physics of Fundamental Interactions
- **SSD:** FIS/01 – Experimental Physics
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Code PE0000013
- **CUP:** J33C22002830006
- **Project manager:** Daniele Bonacorsi
- **Project title:** Pervasive Artificial Intelligence (AI) in connection to fundamental research in Physics: application and founding principles of Machine Learning techniques for innovative, performing, controllable and explainable AI methods for Fundamental Physics
- **Duration of contract:** 36 months
- **Brief description of the project:** The research activity will be conducted in the Spoke 8 of the “Enlarged Partnership” PE1 within the NRRP, named “Future Artificial Intelligence Research (FAIR)”. The spoke will investigate multi-disciplinary challenges derived by “Pervasive AI” systems, with focus on the introduction of intelligent models/algorithms into solutions needed for data handling, data selection and data analysis in research challenges in Fundamental Physics. The work aims at advancing the state of the art in modeling and algorithmic techniques, in theoretical grounding principles, in architectural and implementation solutions. The work also aims at developing rigorous methods at the intersection of mathematics, physics, statistics and computer science, to understand how, why and to what extent modern ML models work, with the purpose to contribute towards next-generation AI tools that are robust, effective and explainable and that can boost AI ubiquitous diffusion and uptake in Fundamental Physics.
- **Objective of the research project:** The objectives of scientific productivity will be finalized, over the three-year period, to the presentation of the research results to at least two conferences of recognized prestige inherent in the themes of high-energy physics or computing, and publication (as co-author) of three paper/year in international indexed journals (Scopus/WOS).



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- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 14

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 02/B1 – Experimental Physics of Matter
- **SSD:** FIS/03 – Physics of Matter
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE3 – RETURN, “Multi-risk science for resilient communities under a changing climate” – Code PE00000005
- **CUP:** J33C22002840002
- **Project manager:** Francesco Saverio Violante
- **Project title:** Investigation of external pollutants in human tissue through advanced nano-microscopy techniques and wearable sensors for environmental health
- **Duration of contract:** 36 months
- **Brief description of the project:** The RTD would analyze human tissues (from biopsy) with Electronic Microscopy techniques, investigating external contaminants in human organs and tissues. The aim is the evaluation of environmental pollution and its effect on human body, paying attention to the influence induced by the climate change. The contaminants would be quantified, analyzed (chemical composition, morphology, interaction/contact with the tissue/organ under examination) and organized in data banks for statistical analysis. Their toxic effects would be evaluated with in-vitro biocompatibility and cytotoxicity assays. Contemporary a wearable multisensing platform unit would be realized, monitoring external toxic compounds (air quality warning) or physiological parameters. The scope is the enhancement of individual and collective protection from external environmental factors (especially related to climate change).
- **Objective of the research project:** During the project the researcher must publish at least 12 articles in peer-reviewed journals and attend at least 6 national or international meetings relevant for the subject of the project.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 15

The specific elements of this procedure are as follows:

- **Number of positions:** 2
- **SC:** 04/A3 – Engineering Geology, Physical Geography and Geomorphology
- **SSD:** GEO/05 – Engineering Geology
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR Funds – Call PE – Project PE3 – RETURN, “Multi-risk science for resilient communities under a changing climate” – Code PE00000005
- **CUP:** J33C22002840002
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Duration of contract:** 36 months
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English
- **Description of the projects and their specific elements:**
 - 1) **Project 1** – Department of Civil, Chemical, Environmental, and Materials Engineering - DICAM
 - **Title:** Adaptation strategies of critical infrastructures to geo-hydrological instability in the context of climate change
 - **Project manager:** Lisa Borgatti
 - **Brief description of the project:** The research will be aimed at analyzing the non-linear evolution of landslide susceptibility and hazard in the context of climate change, in accordance with the National Adaptation Strategy which considers the analysis of the risk connected to the management of the critical infrastructures that interact with waters and slopes cannot be deferred. The project aims to provide the evolutionary scenarios necessary for the assessment of the vulnerability trajectories of the exposed elements, even in coupled or cascading risk conditions, and to contribute to the definition of adaptation plans with particular reference to critical infrastructures.
 - **Objective of the research project:** In the context of the objectives of the Extended Partnership RETURN project, the scientific research activity must ultimately be aimed at obtaining a high-level academic profile. The scientific productivity objectives to be achieved at the end of the three-year period consist of at least 3 publications in indexed international

scientific journals and at least 3 presentations at national and international sector congresses and conferences.

2) Project 2 – Department of Biological, Geological, and Environmental Sciences - BiGeA

- **Title:** Detection, monitoring, and modelling of landslides for the development of effective risk mitigation strategies
- **Project manager:** Matteo Berti
- **Brief description of the project:** The research project plans to integrate field data, monitoring data, and satellite measurements for the analysis of landslides in a representative area of the Northern Apennines. The work will be carried out in the following steps: 1) creation of a digital twin of the study area in a GIS environment containing all the information useful for the quantitative definition of landslide susceptibility; 2) areal characterization of the state of activity of landslides through the analysis of interferometric satellite measurements (EGMS platform and dedicated processing of Sentinel 1 images); 3) ground monitoring of active landslides using interferometric radar, robotic total stations, GPS-RTK networks and geotechnical instrumentation; 4) numerical modeling of the monitored landslides to improve the knowledge of the initiation, propagation and arrest processes; 5) upscaling of areal scale analyzes for the definition of probabilistic event scenarios suitable for risk mitigation.
- **Objective of the research project:** 1) Creation of a monitoring dataset to be shared with the scientific community on an Open Data repository 2) Scientific papers in international journals with peer-review and indexed on Scopus and WoS in the field of Applied Geology, Geomorphology and Geotechnical Engineering relating to the topics covered by the research (at least 2 publications) 3) Creation of a project monograph containing a detailed description of the methods adopted and the results obtained.

ATTACHMENT 16

The specific elements of this procedure are as follows:

- **Department:** Department of Civil, Chemical, Environmental, and Materials Engineering - DICAM
- **SC:** 08/A1 – Hydraulics, Hydrology, Hydraulic and Marine Constructions
- **SSD:** ICAR/01 – Hydraulics
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE3 – RETURN, “Multi-risk science for resilient communities under a changing climate” – Code PE00000005
- **CUP:** J33C22002840002
- **Project manager:** Vittorio Di Federico
- **Project title:** Upscaling and inverse modeling of flow and transport in fractured geological media.
- **Duration of contract:** 36 months
- **Brief description of the project:** The research will focus on modeling coupled flow and transport in fractured geological media from pore- to field scale, for a physical process of interest in the subsurface environment. Different fluid rheology will be considered to handle applications in the context of subsurface natural resources exploration and exploitation. Information-theory and data-driven meta-modeling techniques will be employed to develop and accelerate multiscale model simulations of the investigated physical process. Data collected at different scales will be used to infer parameters via inverse modeling. Finally, uncertainty quantification will be pursued to evaluate the potential risk associated with the phenomena in a probabilistic framework.
- **Objective of the research project:** Three papers on ISI/SCOPUS indexed journals.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 17

The specific elements of this procedure are as follows:

- **Number of positions:** 9
- **SC:** 01/B1 - Informatics
- **SSD:** INF/01 - Informatics
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Description of the projects and their specific elements:**
 - 1) **Project 1** – Departments of the Arts - DAR, 1 position
 - **Title:** Computer science methods and tools for the support of Made in Italy
 - **Financial coverage:** PNRR Found – Call PE – Project PE11 – 3A-ITALY, “Made in Italy Circolare e Sostenibile” – Codice PE0000004
 - **CUP:** J33C22002950001
 - **Main place of employment:** Rimini
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Gustavo Marfia
 - **Brief description of the project:** 1) methodologies for the identification and development of applications and IT platforms to support the various activities of design, construction, distribution and marketing of products that derive from the creativity of operators active in the Made in Italy sector, 2) identification and preparation of digital tools for the support of Made in Italy processes, in order to identify the tools and IT platforms to support the various activities that derive from the creativity of the operators active in the Made in Italy sector, 3) identification of effective and computerized strategies for automatic testing of the identified tools.
 - **Objective of the research project:** - two scientific articles published in international scientific journal; - four scientific articles published in proceedings of international conferences
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
 - 2) **Project 2** – Departments of Computer Science and Engineering - DISI, 1 position
 - **Title:** Smart mobility and sustainability for a better quality of life

- **Financial coverage:** PNRR Found – Call ECO – Project ECOSYSTER, “Ecosystem for Sustainable Transition in Emilia-Romagna” – Codice ECS00000033
 - **CUP:** J33C22001240001
 - **Main place of employment:** Cesena
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Franco Callegati
 - **Brief description of the project:** The scientific activity of the researcher will be focused on studying strategies and solution to support sustainability and safeness both in industrial and in urban contexts, with specific reference to design for all approaches to support virtuous behaviours to decrease different types of pollution and to improve active citizenship, technological and social innovation, by exploiting also artificial intelligence techniques, machine learning algorithms, and digital twins approaches.
 - **Objective of the research project:** The goal of the researcher in term of scientific production, during the 3 years, will be the publication of at least 6 papers in international venues (scientific journals and conference proceedings), with at least 2 of them in international journals.
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 3) **Project 3** – Departments of Computer Science and Engineering - DISI, 1 position
- **Title:** Formal Methods and Type Systems for Quantum Programming Languages
 - **Financial coverage:** PNRR Found – Call CN – Project HPC, “National Centre for HPC, Big Data and Quantum Computing” – Code CN00000013
 - **CUP:** J33C22001170001
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Ugo Dal Lago
 - **Brief description of the project:** The researcher will deal with defining formal and type systems for programming languages targeting quantum HW architectures. In particular, we will focus on languages for the manipulation of quantum circuits and on type systems guaranteeing non-functional properties regarding the amount of resources used, with particular emphasis on the number of qubits and the depth of the produced circuit. The research activity will concern the definition of the type system, its proof of correctness and possibly the implementation of type-inference algorithms.

- **Objective of the research project:** The researcher must aim at an excellent level of scientific productivity, with publications in the proceedings of the most important conferences and in the most prestigious scientific journals in the area of programming languages and formal methods. It is not excluded that the research activity in question will give rise to SW prototypes.
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 4) **Project 4** – Departments of Computer Science and Engineering - DISI, 1 position
- **Title:** HPC Culture: Understanding High-Performance and Quantum Computing models, for Professional and Citizenship Education
 - **Financial coverage:** PNRR Found – Call CN – Project HPC, “National Centre for HPC, Big Data and Quantum Computing” – Codice CN00000013
 - **CUP:** J33C22001170001
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Simone Martini
 - **Brief description of the project:** Research activities will focus on High-Performance and Quantum Computing from epistemological and educational perspectives, to distill the fundamental ideas underpinning these computing paradigms and to study how to teach them to different stakeholders. Giving professionals of other fields the intellectual instruments to effectively understand the fundamentals is crucial for them to use and integrate these paradigms in their activities. Moreover, dissemination activities can give citizens adequate comprehension of the technologies that are (and, more and more, will) significantly impact their lives. The research will also favor a holistic and integrated multidisciplinary and interdisciplinary problem-solving approach. Identifying the contributions of different disciplines (e.g., computer science and engineering, physics, data science) to the two paradigms can foster complementary approaches and innovation from experts in different areas.
 - **Objective of the research project:** The researcher should produce one original scientific article published in a scientific journal and three scientific articles published in the proceedings of international conferences
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian

- **Foreign language:** English
- 5) **Project 5** – Departments of Computer Science and Engineering - DISI, 1 position
- **Title:** Autonomous Driving: perception and control
 - **Financial coverage:** PNRR Found – Call CN – Project MOBILITY, “Sustainable Mobility Center (Centro Nazionale per la Mobilità Sostenibile)” – Codice CN00000023
 - **CUP:** J33C22001120001
 - **Main place of employment:** Cesena
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Giovanni Pau
 - **Brief description of the project:** The researcher will focus on the design, implementation and evaluation of strategies, algorithms and system solutions that aim at improving autonomous driving at large. The researcher will have to coordinate with the other members of the project and design experiments able to assess the performance of the proposed system in realistic settings.
 - **Objective of the research project:** The goal of the researcher in term of scientific production, during the 3 years, will be the publication of at least 6 papers in international venues (scientific journals and conference proceedings), with at least 2 of them in international journals
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 6) **Project 6** – Departments of Computer Science and Engineering - DISI, 1 position
- **Title:** IoT-based systems and acquisition and processing platforms of heterogeneous data for the smart management of agricultural and environmental ecosystems
 - **Financial coverage:** PNRR Found – Call CN – Project AGRI, “National Research Centre for Agricultural Technologies” – Codice CN00000022
 - **CUP:** J33C22001150008
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Marco Di Felice
 - **Brief description of the project:** The research project addresses the design, implementation and performance evaluation of IoT systems and platforms for agricultural and environmental systems, with a special focus towards applications related to smart monitoring/management of water resources. More specifically, the activities will focus on

the acquisition, management ed integration of sensory data produced by heterogeneous IoT devices, both static and mobile (the latter installed on robots or rovers). To this aim, the candidate will investigate interoperability solutions in the IoT domain in order to face the fragmentation of protocols/data formats and to support the data processing of heterogeneous data streams to make them available to the end users or other software systems. Recent solutions based on open platforms/standards (e.g. FIWARE and the Web of Things) and on semantic data enrichment techniques may be taken into consideration and properly extended/customized for agricultural and environmental systems.

- **Objective of the research project:** The expected scientific productivity consists in a minimum of 3 publications per year, hence 9 publications in total during the three years contract. Three publications (over the 9 expected) must be journal publications on topics in line with the project's activities.
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 7) **Project 7** – Departments of Computer Science and Engineering - DISI, 1 position
- **Title:** AI methods for educational technology and combating early school leaving
 - **Financial coverage:** PNRR Found – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Codice PE0000013
 - **CUP:** J33C22002830006
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Maurizio Gabbrielli
 - **Brief description of the project:** Research activities will be structured as follows: 1. Comparative study of the state of the art highlighting the main AI approaches used in educational sciences to monitor students' careers. 2. Design of a conceptual and technical framework to model systems for the prediction of school dropout and in general to combat the phenomenon of school dropout. 3. Prototyping the above-mentioned framework by exploiting appropriate technologies and adopting modern development techniques.
 - **Objective of the research project:** - development and prototyping of a framework for combating early school leaving; - publication of at least one article in an international journal; - publication of at least three contributions in international conferences or workshops.
 - **Admission requirement:** PhD

- **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 8) **Project 8** – Departments of Classical Philology and Italian Studies - FICLIT, 1 position
- **Title:** Production and handling of FAIR data in the context of the cultural heritage in museums and art collections
 - **Financial coverage:** PNRR Found – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Codice PE0000020
 - **CUP:** J33C22002850006
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Silvio Peroni
 - **Brief description of the project:**

A) Research activity concerning the project of the Partenariato Esteso 5 (“Changes”), Spoke 4 (“Virtual Technologies for Museums and Art Collections”), attached. The goal of the activity focusses on the creation of workflows, and their related implementation through the development, reuse, and adaptation of appropriate software, that enables the creation of Cultural Heritage FAIR (Findable, Accessible, Interoperable and Reusable) data in the context of the Spoke 4, and of the related use cases referring to six distinct types of museums: high-density and innovative museum, natural history and scientific museum, widespread art gallery, sites museums with no virtual and digital implementations, historical palaces, demo-ethnic-anthropological museums.

B) Teaching activity: teachings related to the SSD INF/01 in the context of the bachelor and master courses of the University of Bologna and, in particular, those of the Department of Classical Philology and Italian Studies
 - **Objective of the research project:** To write at least two scientific articles (journal articles, book chapters, conference or workshop papers published in proceedings), also in collaboration with a research group. Participation to at least one conference as a speaker. Production of at least two digital objects (datasets, collections, data models, software), also in collaboration with a research group.
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English

- 9) **Project 9** – Departments of Modern Languages, Literatures, and Cultures - LILEC, 1 position
- **Title:** Human and artificial creativity: artificial intelligence for human-machine cooperation in the creative process based on the formalization of implicit knowledge and non-concrete objects. Demonstration of a use case in the music field
 - **Financial coverage:** PNRR Found – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Codice PE0000013
 - **CUP:** J33C22002830006
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Valentina Presutti
 - **Brief description of the project:** The RTD will develop multidisciplinary research to contribute to a deeper understanding of the creative process and for supporting it with formal models and algorithms that combine knowledge representation and engineering with machine learning techniques. It will focus on empirical analysis of large-scale data, both structured and unstructured, describing creative work produced by both humans and artificial agents. A research goal is to define a formal theory encompassing creative agents, objects and processes supported by evidence from the data and that is informed and contributes to clarifying or extending the most relevant semiotic and cognitive theories. Specific attention will be given to the acquisition and formalization of implicit knowledge and to the recognition of non-concrete objects. The main working tools include semantic web technologies, including knowledge graphs and ontologies and their combination with learning models.
 - **Objective of the research project:** This research will aim at developing:
 - A reference corpus (background knowledge) from the web and from creative work-related repositories;
 - A systematic assessment of existing commonsense resources from the web and their integration and enrichment (as ontologies and knowledge graphs) through inductive and deductive reasoning;
 - Experiments with diverse hybrid systems combining existing ontologies and knowledge graphs with learning models (e.g., transformers, convolutional networks);
 - Methods for analysing large-scale data about creative work created by artificial and human agents;
 - An evidence-based formal theory encompassing creative agents, objects, and processes, based on, and informing, semiotic and cognitive theories;
 - Methods for implicit knowledge acquisition and formalisation;

- Methods for non-concrete objects detection (e.g. values, emotions) from unstructured content;
- A prototype for the co-operation between human and artificial agents in the music domain;
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 18

The specific elements of this procedure are as follows:

- **Department:** Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
- **SC:** 09/F1 – Electromagnetic Fields
- **SSD:** ING-INF/02 – Electromagnetic Fields
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE14 - RESTART “Research and innovation on future Telecommunications system and networks, to make Italy more smRT”, code PE0000001
- **CUP:** J33C22002880001
- **Project manager:** Diego Masotti
- **Project title:** End-to-end modelling of efficient and compact dynamic WPT systems exploiting new TX/RX topologies, electronic devices, and reconfigurable intelligent surfaces based on nanomaterials.
- **Duration of contract:** 36 months
- **Brief description of the project:** The research activity will mainly consist of the design of efficient Tx/Rx subsystems operating at microwave and millimeter-wave for WPT purposes, including smart reconfigurable surfaces exploiting the tunability of nano-scale ferroelectric materials, by taking into account the real application scenario. This will be possible through the development of new multi-frequency models of the wireless links based on theoretical/numerical simulations.
- **Objective of the research project:** The research project aims not only to realize prototypes of Tx/Rx devices and advanced metasurfaces to be used in WPT links with special emphasis on compactness and efficiency, but also to create new models for the fast and precise wireless link characterization for an accurate estimation of the overall system performance in the real propagation scenario. These activities will be supported by the publication of the obtained results in specialized journals and in the proceedings of important conferences of the sector
- **Admission requirement:** PhD
- **Maximum number of publications:** 12



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- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 19

The specific elements of this procedure are as follows:

- **Department:** Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
- **SC:** 09/G1 – Systems and Control Engineering
- **SSD:** ING-INF/04 – Systems and Control Engineering
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE11 – 3A-ITALY, “Made in Italy Circolare e Sostenibile” – Code PE0000004
- **CUP:** J33C22002950001
- **Project manager:** Claudio Melchiorri
- **Project title:** Design and development of intelligent systems for robotic manipulation and physical human-robot interaction
- **Duration of contract:** 36 months
- **Brief description of the project:** Candidates are required to develop research activities, at a theoretical and applicative level, in the field of control systems for robotic manipulation systems, human-robot physical interaction and advanced prosthetic systems. The appropriate combination of advanced control methodologies, data-driven modeling methods and innovative mechatronic design techniques is essential to increase the efficiency and robustness of human-robot manipulation and physical human-robot interfaces. Candidates must show an aptitude for developing methodological and applicative research with particular attention to these aspects. The technological aspects, for the implementation of the proposed solutions, must be considered to reach a meaningful practical experimentation through suitable laboratory prototypes
- **Objective of the research project:** Candidates are required to publish every year at least one article in international journals with high Impact Factor in the sector (such as IEEE Transactions on Robotics, IEEE Transactions on Automation Science and Engineering, IEEE Control Systems Technology, IEEE/ASME Transactions on Mechatronics, IEEE Robotics and Automation Letters) and at least three on international conference proceedings relevant to the sector (such as IEEE/RSJ International Conference on Intelligent Robots and Systems, IEEE International Conference on Robotics and Automation, IFAC World Congress).



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- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** English
- **Foreign language:** No

ATTACHMENT 20

The specific elements of this procedure are as follows:

- **Department:** Department of Computer Science and Engineering - DISI
- **SC:** 09/H1 - Information Processing Systems
- **SSD:** ING-INF/05 – Information Processing Systems
- **Number of positions:** 6
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** AI and big-data analytics for the sustainability of production systems in agriculture
 - **Financial coverage:** PNRR Found – Call CN – Project AGRI, “National Research Centre for Agricultural Technologies” – Code CN00000022
 - **CUP:** J33C22001150008
 - **Main place of employment:** Cesena
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Matteo Golfarelli
 - **Brief description of the project:** Agriculture-oriented applications generate a vast amount of data from IoT, satellite, and robotic sources. Managing this data requires the adoption of AI and big-data solutions to improve the efficiency of the productive processes in agriculture as well as the management of water, fertilizers, and machines. The goal of the project is to design and engineer a data platform that enables the interoperability between these heterogeneous data sources and that enables analytics supporting farmers/technicians in the decision-making processes. The data platform will have to adopt minimally invasive integration approaches supported by a common abstraction layer and agriculture-specific data models that enable a unified representation/querying of data sources as well as of the extracted knowledge — to make it accessible for further analytics. The data platform will act as a data hub that allows the development of further research conducted in the field of agriculture.
 - **Objective of the research project:** 1. Prototyping of at least one innovative approach for the management and analysis of data in the agriculture domain; 2. Publication of at least two articles in international journals; 3. Publication of at least three contributions in international conferences or workshops
 - **Admission requirement:** PhD

- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

2) Project 2 – Title: Architectures and Platforms for QoS-aware Orchestration of Virtualized Resources over IoT and Edge-cloud Federated Experimental Testbeds

- **Financial coverage:** PNRR Found – Call IR – Project "Sobigdata.it" – Code IR0000013
- **CUP:** B53C22001760006
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Project manager:** Luca Foschini
- **Brief description of the project:** Methodologies, models, and algorithms for the efficient orchestration of virtualized resources over large-scale testbeds, with monitoring, control, and runtime management of quality of service (primarily latency and reliability). In particular, a primary project objective will be the development and prototyping of a wide-scale national testbed, then to be integrated at the EU level thanks to the full compliance with the standard specifications defined within the EU ESFRI SLICES project. Special attention will be dedicated to the innovative aspect of QoS-aware integrated management of computing, storage, and networking virtualized resources in dynamically determined node chains in the cloud continuum.
- **Objective of the research project:** At least 3 international publications, of which at least one on an international journal with high visibility and prestige (e.g., with high WOS Impact Factor or in the first two quartiles of the Scimago SJR ranking).
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

3) Project 3 – Title: Scalability and transferability of neuro-Symbolic systems

- **Financial coverage:** PNRR Found – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Code PE0000013
- **CUP:** J33C22002830006
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 30

- **Project manager:** Michela Milano
 - **Brief description of the project:** Neuro-symbolic systems are widely studied and used in the research community for their capability of merging knowledge coming from human domain experts with knowledge extracted from data. In addition, the capability of explaining the decision taken by an intelligent systems given by the symbolic component is glued with the capability of predicting and classifying coming from deep learning. However, neuro-symbolic systems have serious limitations in terms of scalability that prevent the application of such systems in large sociotechnical systems to face global societal challenges that pervade our times. In addition, transfer an intelligent systems trained on a given set of data to another similar application often leads to worse performances. The RTDA will focus on these two aspects so that to overcome the limitations of these systems while maintaining its advantages.
 - **Objective of the research project:** It is considered a reasonable objective the publication of two papers in international conferences and one paper on an international journal
 - **Admission requirement:** PhD
 - **Maximum number of publications:** 12
 - **Language in which the interview will take place:** Italian
 - **Foreign language:** English
- 4) **Project 4 – Title:** Integrating symbolic and subsymbolic AI techniques for explainable intelligent systems
- **Financial coverage:** PNRR Found – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Codice PE0000013
 - **CUP:** J33C22002830006
 - **Main place of employment:** Cesena
 - **Number of hours of frontal teaching per year:** 60
 - **Project manager:** Andrea Omicini
 - **Brief description of the project:** 1. Comparative analysis of the state of the art, identifying the main similarities and differences among data science and computational logics with respect to XAI, pursuing the goal of highlighting the complementarities among the two disciplines, as well as detecting any open problem hindering their integration 2. Designing a conceptual and technical framework providing adequate abstractions to model concepts related to the symbolic explanation of sub-symbolic AI techniques, hence enabling the definition, analysis and development of algorithms reifying it in practice—possibly in a (semi-)automatic way 3. Prototyping the aforementioned framework, via adequate technological stacks, possibly adopting modern software development practices (e.g.

continuous delivery/integration, test driven development, etc.), following the purpose of producing re-usable and open-source software tools for research.

- **Objective of the research project:** development of a prototype of an integrated symbolic/subsymbolic framework; at least two publications on international journals; at least four contributions at international conferences or workshops
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

5) Project 5 – Title: New risk management models and security solutions for cyberphysical systems.

- **Financial coverage:** PNRR Found – Call PE – Project PE7 – SERICS, “SEcurity and Rlghts in the CyberSpace” – Code PE0000014
- **CUP:** J33C22002810001
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 50
- **Project manager:** Michele Colajanni
- **Brief description of the project:** The research activities intend to propose an innovative approach to cybersecurity and the resilience of cyber-physical systems. The research has the ambition to propose innovative methodologies and tools for design, development and testing that include risk assessment by design of the entire supply chain and innovative cloud-ZTA systems. Since the digitalization of cyber-physical contexts will dramatically increase the risks of cybersecurity and safety, it will be of strategic importance to design and test intrinsically resilient environments also from an operational point of view from the design phase of the plants and services so as to reduce the risks resulting from breakdowns or cyber attacks or to mitigate their effects as a result of intrusions, thefts, infections, downtime.
- **Objective of the research project:** At least 7 scientific papers with at least 3 presentations at international conferences
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

6) Project 6 – Title: Low Latency Cloud Continuum for Beyond 5G Heterogeneous Networking

- **Financial coverage:** PNRR Found – Call PE – Project PE14 – “RESTART: RESearch and innovation on future Telecommunications systems and networks, to make Italy more smART” – Codice PE0000001
- **CUP:** J33C22002880001
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Project manager:** Paolo Bellavista
- **Brief description of the project:** Research and development activities for innovative middleware aimed at latency optimization in next generation networks for the cloud continuum. In particular, we will consider novel solutions for the integrated management of latency requirements involving computing and networking over virtualized resources, by taking into account pervasive computing deployment scenarios where the core network integrates with a last mile with possibly heterogeneous wireless technologies (WiFi6, B5G/6G, Time Sensitive Networking for wired/wireless networks, ...). Primary objectives will be the extension, implementation, and integration with state-of-the-art network acceleration techniques that employ kernel bypassing and QoS-aware Message Oriented Middleware.
- **Objective of the research project:** At least 3 international publications, of which at least one on an international journal with high visibility and prestige (e.g., with high WOS Impact Factor or in the first two quartiles of the Scimago SJR ranking)
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 21

The specific elements of this procedure are as follows:

- **Department:** Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
- **SC:** 09/G2 – Bioengineering
- **SSD:** ING-INF/06 – Electronic and Informatics Bioengineering
- **Number of positions:** 1
- **Main place of employment:** Cesena
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE6 – HEAL ITALIA “Health Extended Alliance For Innovative Therapies, Advanced Lab-Research, and Integrated Approaches of Precision Medicine”, Code PE0000019
- **CUP:** J33C22002920006
- **Project manager:** Stefano Severi
- **Project title:** Development of “digital twin” cardiac models to support diagnostic prediction, medicine and personalized therapeutic treatment
- **Duration of contract:** 36 months
- **Brief description of the project:** Starting from the state of the art of "digital twin" applied to cardiology, the project will focus on the development of advanced methodologies and technologies to characterize and classify different phenotypes of heart disease (eg. HCM), with the aim of diagnosing and proposing increasingly personalized precision therapies. Multiscale mathematical models and simulation tools will be developed to bridge the gap between clinical and in-vitro data to characterize the phenotypes. The effects of the diseases, based on current clinical knowledge, will be integrated within mathematical models of human cardiac electrophysiology and contractility. Using these tools, we will provide improved support to clinical decisions and initial risk stratification for cardiac pathologies. In a broader view, the developed methodology and tools can be used for patient stratification for other heart diseases as well, integrating models and data of various scales and types.
- **Objective of the research project:** The publication of at least 3 articles (one per year) in peer-reviewed scientific journals is expected, the participation and presentation of research at national and international conferences, and the creation of models and software that will be made available on a web platform.
- **Admission requirement:** PhD



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- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 22

The specific elements of this procedure are as follows:

- **Department:** Department of Sociology and Business Law - SDE
- **SC:** 12/B2 – Labour Law
- **SSD:** IUS/07 – Labour Law
- **Number of positions:** 1
- **Main place of employment:** Forlì
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Codice PE0000018
- **CUP:** J33C22002910001
- **Project manager:** Emanuele Menegatti
- **Project title:** Algorithmic management and workers’ privacy
- **Duration of contract:** 36 months
- **Brief description of the project:** The research is aimed at analyzing the impact of artificial intelligence in the employment relationship, with particular attention to respect for the workers’ privacy. While making the employer's activity easier, it is undeniable that the so-called algorithmic management systems present critical aspects related to workers' rights. Hence the importance that automated choices comply with the workers' privacy regulations provided for by the GDPR, respecting the criteria of minimization, transparency and data manipulation, as well as ensuring that no decision is based solely on an automated process. The application of the legal tools for the protection of privacy in relation to the algorithmic systems for managing employment relationships will be the subject of the research activity.
- **Objective of the research project:** 1) Publication of at least one monograph of scientific relevance or 2 articles in a top-class ranked journal (according to the ANVUR classification) for the SSD IUS/07; 2) Publication of an article in a journal or volume with recognized scientific value; 3) Participation in national and international conferences and congresses.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 23

The specific elements of this procedure are as follows:

- **Department:** Department of the Arts - DAR
- **SC:** 10/B1 – Art History
- **SSD:** L-ART/02 – History of Modern Art
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Codice PE0000020
- **CUP:** J33C22002850006
- **Project manager:** Daniele Benati
- **Project title:** 3D technologies for early-modern sculpture: digital strategies for museums
- **Duration of contract:** 36 months
- **Brief description of the project:** The aim of the project is to use 3-D scanning technology to improve the accessibility, conservation and study of sculptures and decorative arts from the 15th to the 18th century in the collections of the Gallerie Estensi and to enhance the visitors' access to objects on display in the galleries through the creation of open-access digital copies. These virtual models will be accessible through the museum's website. Each object on display in the galleries will be signaled to visitors through a QR code. The research's main focus will be on medium- and small-size objects whose access is usually reduced by their challenging display in the galleries or by conservation needs, but whose artistic quality lies in their three-dimensional shape and close-up observation. Image-based and range-based 3D survey systems will be used to create interactive virtual models and short videos. A possible research period abroad is foreseen from a minimum of six (6) months to a maximum of twelve (12) months (optional) by identifying the foreign host structure.
- **Objective of the research project:** During the period of the contract, the researcher is expected to:
 - publication of three articles in scientific journals, or an equal number of contributions in collective volumes of high scientific profile, or a monograph;
 - participation in two scientific congresses or conferences;
 - direct collaboration in the organization and management of the interoperable and open data digital platform, intended as a Content Management System, which can be integrated and accessible online.
- **Admission requirement:** PhD



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- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 24

The specific elements of this procedure are as follows:

- **Number of positions:** 2
- **Department:** Department of Interpreting and Translation - DIT
- **SC:** 10/L1 – English and Anglo-American Languages, Literatures and Cultures
- **SSD:** L-LIN/12 – Language and Translation - English
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Main place of employment:** Forlì
- **Number of hours of frontal teaching per year:** 60
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** Museum communication and accessible communication in English
 - **Financial coverage:** PNRR Funds – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Code PE0000020
 - **CUP:** J33C22002850006
 - **Project manager:** John Patrick Leech
 - **Brief description of the project:** The valorisation of museums, art galleries and heritage sites involves the interpretation of heritage to a diversified audience. Accessible communication, especially in the form of plain and easy language, is thus an essential resource for their valorisation as it encourages inclusion through the use of texts that are linguistically appropriate to the needs of an increasingly diverse public. These texts can profit from new technologies to reach large and diversified audiences, in order to enhance the inclusivity of museums. The aims of this project are thus to analyse the linguistic features of plain and easy English in these settings; to develop a set of texts in plain and easy English for a museum context using new technologies; and to carry out a reception study of the developed product.
 - **Objective of the research project:** During the period of the contract, the researcher of this project will produce a minimum of 3 publications in recognized scientific reviews or

edited volumes with ISBN and 3 presentations at conferences, of which at least two of international relevance.

- 2) **Project 2 – Title:** Identification of the neurocognitive bases of intra- and inter-individual differences in language perception and production in late bilinguals
- **Financial coverage:** PNRR Found – Call PE – Project PE12 – MNESYS “A multiscale integrated approach to the study of the nervous system in health and disease” – Code PE000006
 - **CUP:** J33C22002970002
 - **Project manager:** Amalia Agata Maria Amato
 - **Brief description of the project:** Acquiring a second language (L2) is associated with a reorganisation of extensive brain networks. In bilinguals, neuroplasticity is continually challenged by the extreme control of known languages (code-switching) under pressing temporal constraints. The proposed research activity will address inter-individual differences in language perception and production related to expertise with an L2 in the face of certain stimuli, such as the speech rate of the interlocutor or the required language production, in order to characterise the neural substrates that support these differences. The research activity involves the comparative study of late bilingual subjects with differentiated code-switching experience (novice vs. expert paradigm). These will be subjected to assessments of linguistic fluency and executive functions, also by means of neurophysiological and neurostimulation techniques, to study the neurofunctional organisation of the bilingual brain.
 - **Objective of the research project:** During the contract period, the researcher in charge of this project will produce a minimum of 3 publications in international indexed scientific journals.

ATTACHMENT 25

The specific elements of this procedure are as follows:

- **Department:** Department of Mathematics - MAT
- **SC:** 01/A3 – Mathematical Analysis, Probability and Statistics
- **SSD:** MAT/05 – Mathematical Analysis
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE12 – MNESYS “A multiscale integrated approach to the study of the nervous system in health and disease” – Code PE000006
- **CUP:** J33C22002970002
- **Project manager:** Giovanna Citti
- **Project title:** Mathematical models of the functional organization of brain networks
- **Duration of contract:** 36 months
- **Brief description of the project:** The researcher will develop mathematical instruments necessary to express models of the functional architecture of brain networks underlying sensorimotor integration, in particular brain connectivity, in physiological conditions or in presence of neurological disorders. In particular the analytical techniques of interest for the problem include: PDEs, geometric analysis, free boundaries problems, calculus of variations, optimal transportation, complex and harmonic analysis, contact and symplectic analysis, Machine Learning and image analysis.
- **Objective of the research project:** The scientific productivity objectives of the researcher will be aimed at the achievement of notable scientific results which may be published in scientific papers on peer-reviewed international journals of high quality, at the participation to conferences for the diffusion of the results and at the submission of research projects.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 26

The specific elements of this procedure are as follows:

- **Number of positions:** 2
- **Department:** Department of Mathematics - MAT
- **SC:** 01/A4 – Mathematical Physics
- **SSD:** MAT/07 – Mathematical Physics
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Project manager:** Emanuela Caliceti
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian or English based on the candidate's choice
- **Foreign language:** English
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** Founding principles of machine learning for controllable and explainable artificial intelligence
 - **Financial coverage:** PNRR Funds – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Code PE0000013
 - **CUP:** J33C22002830006
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 60
 - **Brief description of the project:** The research goal is to develop rigorous methods for the study of classical and quantum machine learning. The research will focus on the understanding of how the structure of the dataset is codified in the machine parameters, why greedy algorithms can train machines to accomplish very complex tasks, and what are the information-theoretical and computational limits of current machine learning approaches. Focus will be on energy-based models with correlated interactions and/or block dependent inhomogeneous structures, in order to perform inference on large datasets with structured noise, and the development of new biological and human intelligence inspired learning approaches. Useful mathematical tools will be dimension reduction and clustering in statistical inference, computational convex/non-convex optimization, optimal control and optimal transport methods (classical and quantum).

- **Objective of the research project:** The scientific productivity objectives of the researcher will be aimed at the achievement of notable scientific results which may be published in scientific papers on peer-reviewed international journals of high quality, at the participation to conferences for the diffusion of the results and at the submission of research projects.
- 2) **Project 2 – Title:** Risk management for future cyber-physical ecosystems
- **Financial coverage:** PNRR Found – Call PE – Project PE7 – SERICS, “SEcurity and Rlghts in the CyberSpace” – Code PE000014
 - **CUP:** J33C22002810001
 - **Main place of employment:** Rimini
 - **Number of hours of frontal teaching per year:** 60
 - **Brief description of the project:** Introduction of mathematical-physics models for cyber-physical interconnected systems. Introduction of deterministic/stochastic models describing the topology of the interconnections and their evolution, through the theory of complex networks. Development of new inference techniques for an efficient estimation of these models. Introduction of (classical and quantum) mathematical-physics models for the evolution of systems with a large number of units in a network of interactions. Characterization of the asymptotic behavior of such systems in terms of macroscopic properties and dependence on the topology of the underlying network, from the statistical mechanics and complex systems perspective. Study of systemic risk in these models, introducing new measures linked to the emergent macroscopic properties, efficient techniques for anomaly detection and exogenous/endogenous strategies of risk mitigation that lead to systems that are robust to external attacks and internal fluctuations.
 - **Objective of the research project:** The scientific productivity objectives of the researcher will be aimed at the achievement of notable scientific results which may be published in scientific papers on peer-reviewed international journals of high quality, at the participation to conferences for the diffusion of the results and at the submission of research projects.

ATTACHMENT 27

The specific elements of this procedure are as follows:

- **Department:** Department of Mathematics - MAT
- **SC:** 01/A5 – Numerical Analysis
- **SSD:** MAT/08 – Numerical Analysis
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Code PE0000013
- **CUP:** J33C22002830006
- **Project manager:** Serena Morigi
- **Project title:** Cutting-edge numerical optimisation strategies for improving Machine Learning efficacy and efficiency
- **Duration of contract:** 36 months
- **Brief description of the project:** The researcher is called to carry out research activities on the following topics: Design and optimization of variational networks: hybrid AI systems that integrate datadriven AI (regularization learned by data) with model-driven AI (physical model) to improve explainability. Numerical methods and computational aspects for cutting-edge optimization: from regularization strategies to theoretical convergence of Deep Neural Networks. The focus is on solving ill-posed inverse problems and problems of operator identification. Development of - machine and deep learning algorithms with optimal statistical properties and sustainable from the energy/computational point of view and - stochastic optimization methods, implicit regularization strategies and techniques for hyperparameter selection in ANN.
- **Objective of the research project:** Enhancement of research results: scientific publication in refereed and international journals; participation in national and international conferences for the dissemination of results; drafting and submission of national or international research projects within the scope of research topics. Raising of technical and scientific skills: thanks to the cooperation and collaboration between multiple and interdisciplinary sectors young researchers involved by the project will reach a high level of knowledge and expertise, useful to the Italian academic sector but also to fill future relevant managerial roles in Italian

industries. Technology transfer: a crucial role will be played by the interaction with existing Italian innovation actors: other universities, research centres, large companies, SMEs.

- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Based on the candidate's choice
- **Foreign language:** English

ATTACHMENT 28

The specific elements of this procedure are as follows:

- **Department:** Department of Mathematics - MAT
- **SC:** 01/A5 – Numerical Analysis
- **SSD:** MAT/08 – Numerical Analysis
- **Number of positions:** 1
- **Main place of employment:** Ravenna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE11 – 3A-ITALY, “Made in Italy Circolare e Sostenibile” – Code PE0000004
- **CUP:** J33C22002950001
- **Project manager:** Carolina Vittoria Beccari
- **Project title:** Digital Advanced Design: numerical solutions, methodologies and new technologies
- **Duration of contract:** 36 months
- **Brief description of the project:** The researcher is called to carry out research activities on the following topics: Digital Advanced Design: technologies, methodologies and numerical solutions for a smart geometric design in High Quality Representation: i) Investigate geometrical, topological, and non-conventional optimizations supported also by advanced generative modeling systems for the design; ii) image processing solutions for easy products digital manipulation and visualization. Advanced technologies for digitization of objects' visual, physical, and mechanical characteristics; new design principles and technological solutions for human-centric digital workplaces, new solutions for Digital Twins. Design and model manipulation through AI and data driven approaches: ML-based data analysis, ML modelling and data centric AI. Develop of new statistic and analytical data driven numerical techniques for data modelling and visualization.
- **Objective of the research project:** Enhancement of research results: scientific publication in refereed and international journals; participation in national and international conferences for the dissemination of results; drafting and submission of national or international research projects within the scope of research topics. Raising of technical and scientific skills: thanks to the cooperation and collaboration between multiple and interdisciplinary sectors young researchers funded by the project will reach a high level of knowledge and expertise, useful to the Italian academic sector but also to fill future relevant managerial roles in Italian

industries. Technology transfer: a crucial role will be played by the interaction with existing Italian innovation actors: other universities, research centres, large companies, SMEs.

- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 29

The specific elements of this procedure are as follows:

- **Department:** Department of History and Cultures - DiSCi
- **SC:** 11/A5 – Demography, Ethnography and Anthropology
- **SSD:** M-DEA/01 – Demology, Ethnology and Anthropology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Code PE0000020
- **CUP:** J33C22002850006
- **Project manager:** Davide Domenici
- **Project title:** Italian ethnographic museums with extra-European collections facing the decolonial challenge: digitization as knowledge sharing and co-construction
- **Duration of contract:** 36 months
- **Brief description of the project:** The researcher will take part in the project Virtual Technologies For Museums And Art Collections, aimed at providing Italian museums with technologies, applications, and innovative research models based on the connections between artefacts and documental sources. The researcher will investigate the digitization strategies employed by international ethnographic museums, in order to devise forms of heritage digitization which can also address the urgent call to decolonization currently faced by ethnographic museums. The research will explore how the digitization of collections (including documents related with their provenance or cultural biography) and the creation of virtual museums could foster the sharing and co-construction of knowledge, also in relation with source communities. A special attention, even if not exclusive, will be paid to Italian museums with indigenous American collections.
- **Objective of the research project:** The research will produce a project of digitization of one or more extra-European ethnographic collections in Italian museums, potentially also in the form of a virtual museum which could reconstitute collections which were dispersed over the centuries. The selection of the case studies will be made in accord with the research supervisor and, if needed, with directors and curators of the museums involved in the research. During the three years contract, the research must publish at least two articles, one

of them in an academic journal ranked as “class A” by the Italian ANVUR agency. Further digital dissemination actions will be devised in accord with the research supervisor.

- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 30

The specific elements of this procedure are as follows:

- **Number of positions:** 3 (DIBINEM 1 position; DIMEC 2 positions)
- **SC:** 06/A1 – Medical Genetics
- **SSD:** MED/03 – Medical Genetics
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 16
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English
- **Description of the projects and their specific elements:**
 - 1) **Project 1** – Department of Biomedical and Neuromotor Sciences – DIBINEM (1 position)
 - **Title:** Multi-omic analysis of models of mitochondrial neurodegenerative diseases
 - **Financial coverage:** PNRR Funds – Call PE – Project PE12 – MNESYS “A multiscale integrated approach to the study of the nervous system in health and disease” – Code PE000006
 - **CUP:** J33C22002970002
 - **Project manager:** Valerio Carelli
 - **Brief description of the project:** Multi-omic phenotyping and characterization of pathogenic mechanisms in mitochondrial neurodegenerative diseases implies the comparison of ex-vivo tissues from patients (muscle biopsies/blood cells) with patient-derived cellular models (fibroblasts/lymphoblasts). Reprogramming of iPSCs allows to differentiate neuronal cells and organoids (eye and brain). This projects focus are syndromes implying optic atrophy as clinical feature for which iPSCs are already available or under reprogramming (LHON, DOA, MERRF). The genetic causes may reside in either the mitochondrial or nuclear DNA. The genomic and transcriptomic analysis of somatic tissues compared with single cell multi-omics of iPSCs, neuronal progenitors and differentiated neurons/organoids will be combined with functional studies to define the pathogenic mechanisms and targets of possible therapies.

- **Objective of the research project:** During the project the researcher must publish at least 2 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project.
- 2) **Project 2** – Department of Medical and Surgical Sciences – DIMEC (1 position)
- **Title:** Tackling complex neurodevelopmental disorders with RNAzymes targeting common pathway as neuroinflammation and gene-therapy approaches for disease-specific defects
 - **Financial coverage:** PNRR Funds – Call CN – Project mRNA, “National Center for Gene Therapy and Drugs based on RNA Technology” – Code CN00000041
 - **CUP:** J33C22001140001
 - **Project manager:** Elena Bonora
 - **Brief description of the project:** Exome analysis has been carried out at UNIBO with the identification of a number of novel pathogenic variants in neurodegenerative SPG forms and epileptic diseases with leukoencephalopathy and neurodegeneration. The main tasks for developing specific therapies for these disorders will be: 1) screening by exome/genome sequencing an additional sample of 30 NDDs recruited by the clinical collaborators during the project and characterization of the top interesting genes by generation of iPSC disease models; 2) investigating the defective phenotypes of patient’s cells and recovery of the phenotype with gene-editing approaches; 3) generation of iPSC from individuals with monogenic forms of NDD and genome editing of iPSC lines (to create isogenic controls from patient-derived cells) and characterization of these cells with -omics approaches to identify novel molecular targets to be addressed with small RNAs and/or genome editing.
 - **Objective of the research project:** During the project the researcher must publish at least 2 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project
- 3) **Project 3** – Department of Medical and Surgical Sciences – DIMEC (1 position)
- **Title:** Effective RNA/Nuclease therapy for defective/mutant mtDNA
 - **Financial coverage:** PNRR Funds – Call CN – Project mRNA, “National Center for Gene Therapy and Drugs based on RNA Technology” – Code CN00000041
 - **CUP:** J33C22001140001
 - **Project manager:** Caterina Garone
 - **Brief description of the project:** The project goal is to develop novel therapeutic nucleases and mRNA drug for treating mitochondrial disorders.
The junior scientist will achieve the main goal by developing three aims:

- 1: Efficacy and safety of a nucleases library targeting mtDNA mutations in vivo models and GMP production for clinical trial development;
- 2: Efficacy and safety of RNA drugs for mtDNA replication defects in 2D and 3D models;
- 3: Efficacy, safety and delivery of CRISPR-based gene therapy for mtDNA replication defect in vivo models.

After completing the development and characterization of in vivo and in vitro (stem cells and organoids) disease models currently ongoing in our laboratory, the junior scientist will demonstrate the efficacy and safety of the novel designed therapies with phenotypical, molecular genetics, biochemical experimental studies.

- **Objective of the research project:** During the project the researcher must publish at least 2 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project

ATTACHMENT 31

The specific elements of this procedure are as follows:

- **Number of positions:** 3
- **Department:** Department of Experimental, Diagnostic and Specialty Medicine - DIMES
- **SC:** 06/A2 – Experimental Medicine, Pathophysiology and Clinical Pathology
- **SSD:** MED/04 – Experimental Medicine and Pathophysiology
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Duration of contract:** 36 months
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English
- **Description of the projects and their specific elements:**
 - 1) **Project 1 – Title:** Multi-omic approach for big killer diseases: stratification of treatment response and tailored interventions
 - **Financial coverage:** PNRR Funds – Call PE – Project PE6 – HEAL ITALIA “Health Extended Alliance For Innovative Therapies, Advanced Lab-Research, and Integrated Approaches of Precision Medicine”, Code PE0000019
 - **CUP:** J33C22002920006
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 16
 - **Project manager:** Manuela Ferracin
 - **Brief description of the project:** The researcher will work within the PE6 project "HEAL ITALIA - Health Extended Alliance for Innovative Therapies, Advanced Lab-research, and Integrated Approaches of Precision Medicine" to support the research activities of the Spoke 1 "Holistic Nosology - FROM PATIENTS TO MOLECULES & BACK: Mapping the omics landscape of clinical to molecular environment, to identify, classify, and refine the phenotypes of multifactorial diseases ". Specifically, the researcher activity will involve the optimization of assays and procedures for the phenotypic characterization, count, isolation, and in vitro growth of circulating tumor cells (CTC) obtained from different types of cancer patients. These procedures will be used to monitor minimum residual disease and therapy resistance. These data will be used for the identification of personalized response to therapy biomarkers and the development of patient-specific therapeutic strategies.

- **Objective of the research project:** During the project the researcher must publish at least 3 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project.
- 2) **Project 2 – Title:** The role of biomarkers in age-related diseases, multimorbidity and frailty
- **Financial coverage:** PNRR Found – Call PE – Project PE8 - AGE-IT “A novel public-private alliance to generate socioeconomic, biomedical and technological solutions for an inclusive Italian ageing society”, Code PE000015
 - **CUP:** J33C22002900006
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 16
 - **Project manager:** Stefano Salvioli
 - **Brief description of the project:** The project is aimed at deeply characterize geriatric patients suffering from age-related diseases (e.g. Type 2 Diabetes and Alzheimer’s Disease) using advanced biomarkers (already available and/or identified in spoke #2 of PE8) in order to improve diagnosis, prognosis and treatment strategies effectiveness. The data generated will be analysed with advanced statistical approaches in collaboration with other research partners involved in the PE8 Spoke 3’s WP3, with the final goal of testing composite biomarkers signatures to estimate diagnostic/prognostic sensitivity/specificity. More in detail, parameters related to inflammaging and anti-inflammaging as well as biological age will be measured in plasma samples in order to evaluate their efficacy in: 1) discriminating groups of patients with respect to healthy controls or disease severity/progression; 2) prediction of outcome; 3) monitoring therapy success.
 - **Objective of the research project:** During the project the researcher must publish at least 3 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project.
- 3) **Project 3 – Title:** Extracellular vesicles as biomarkers of CAR_T cell therapy neurotoxicity
- **Financial coverage:** PNRR Found – Call PE – Project PE12 – MNESYS “A multiscale integrated approach to the study of the nervous system in health and disease” – Code PE000006
 - **CUP:** J33C22002970002
 - **Main place of employment:** Bologna
 - **Number of hours of frontal teaching per year:** 17
 - **Project manager:** Massimiliano Bonafe'
 - **Brief description of the project:** The project is aimed at Multidimensional phenotyping of extracellular vesicles from plasma and CSF of patients treated with CAR-T therapy who

develop or do not develop neurotoxicity by multiparameter cytofluorometry, multicolor refractometry, dynamic scattering, and trichrome super-resolution microscopy. The project also entails the extraction of RNA and DNA and library set-up for analysis of transcriptomic, epigenomic profiles of extracellular vesicles from plasma and CSF of patients treated with CAR-T therapy who do or do not develop neurotoxicity. Finally, data processing with statistical software and writing scientific papers in collaboration with co-authors is expected.

- **Objective of the research project:** During the project the researcher must publish at least 3 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project.

ATTACHMENT 32

The specific elements of this procedure are as follows:

- **Department:** Department of Education Studies "Giovanni Maria Bertin" - EDU
- **SC:** 11/D1 – Educational Theories and History of Educational Theories
- **SSD:** M-PED/01 – Pedagogy, Theories of Education and Social Education
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE10 – ONFOOD, "Research and innovation network on food and nutrition Sustainability, Safety and Security – Working ON Foods", Code PE0000003
- **CUP:** J33C22002860001
- **Project manager:** Giovanna Guerzoni e Arianna Lazzari
- **Project title:** Onfood. Policy, Behavior and Education. Practices and representation of food and community development: educate to food sustainability in multicultural contexts
- **Duration of contract:** 36 months
- **Brief description of the project:** The activities to be carried out by the researcher are related to the development of issues related to a healthy and sustainable diet within educational and school contexts, to the analysis of perceptions and representations related to food consumption by ethnographical methodology (schooling) to promote sustainable and self-aware eating habits within school communities. In the scope of the project, the researcher will carry out study activities in the field of Social Pedagogy through the use of investigation methodologies typical of participatory action-research and qualitative analysis (schooling): - Analysis of socio-cultural practices and representations about food and eating habits in both public/institutional (schools) and private/family contexts. - Research-action activities to sustain the professional reflexivity of teachers in order to promote nutrition education in middle-schools paying in multicultural contexts.
- **Objective of the research project:** At the end of the contract, the researcher will produce: - a research report summarizing the outcomes of the project with specific reference to analyse school contexts and learning processes (schooling) in connection with the socio-cultural background of the community giving particular attention, through qualitative analysis, to cultural diversity regarding eating habits and representations. - two essays in collective books and/or scientific journals per year.



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- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 33

The specific elements of this procedure are as follows:

- **Department:** Department of Philosophy and Communication Studies - FILCOM
- **SC:** 11/E1 – General Psychology, Psychobiology and Psychometrics
- **SSD:** M-PSI/01 – General Psychology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE1 – FAIR, “Future Artificial Intelligence Research” – Code PE0000013
- **CUP:** J33C22002830006
- **Project manager:** Claudia Scorolli
- **Project title:** PACE - Perception-action coupling in the domain of human and Artificial Creativity: from aesthetic Experience to artistic practice
- **Duration of contract:** 36 months
- **Brief description of the project:** Based on recent empirical evidence supporting common mechanisms for perceived events and events to-be-produced, the RTDa will develop multidisciplinary research aimed at challenging theories of situated cognition in the field of creativity. The investigation will shed light on the circular relationship between aesthetic experience and creative practice. The research activity will integrate methods proper to AI with those of cognitive science and will enable the study of perception in relation to the associated action, generating a feedback loop between natural and artificial creativity. Artificial, immersive, and interactive environments will be created to simulate the experience of enjoying/designing the creative product, incrementally modulating their multisensoriality. The collected data will be: implicit measures indexing cognitive and emotional engagement; the production of linguistic labels informative of the reinterpretation of meanings that follows interaction with the artwork.
- **Objective of the research project:** The researcher's productivity goals over the three years should focus on the production of one or more scientific publications in journals and/or volumes identified as significant with respect to the research field of the project and indexed in international databases (SCOPUS and/or WOS). The researcher will be expected to prioritize the selection of Open Access journals and to commit to employing effective tools to facilitate access to the empirical results. Finally, he/she should engage in the dissemination

of scientific work through the presentation of at least three communications at national and international conferences.

- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 34

The specific elements of this procedure are as follows:

- **Department:** Department of the Arts - DAR
- **SC:** 11/A3 – Contemporary History
- **SSD:** M-STO/04 – Contemporary History
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Code PE0000020
- **CUP:** J33C22002850006
- **Project manager:** Riccardo Brizzi
- **Project title:** Material and Immaterial film and television archives and historical communication
- **Duration of contract:** 36 months
- **Brief description of the project:** The RTDa will carry out his research work in the framework of the PNRR-funded project PE5 - CHANGES Cultural Heritage Active Innovation for Sustainable Society, which aims at the valorisation of cultural heritage and its promotion in an innovative and sustainable context. In this context, the researcher will be called upon to examine the material and immaterial archives of the audiovisual sector with reference to film and television and their impact on historical communication. Through the analysis of the ways in which archival materials useful for historical knowledge are valorised, their communicative purposes will emerge and possible alternatives may also be proposed. The researcher will also be called upon to teach the course History of Mass Communication.
- **Objective of the research project:** The RTDa will take part in the work of the partnership, collaborating on work packages of the consortium. He/she will also participate as a speaker at national and/or international conferences on project topics and produce at least two significant scientific publications on project topics within the three-year period.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 35

The specific elements of this procedure are as follows:

- **Department:** Department of History and Cultures - DiSCi
- **SC:** 11/A3 – Contemporary History
- **SSD:** M-STO/04 – Contemporary History
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE5 – CHANGES, “Cultural Heritage Active Innovation for Next-Gen Sustainable Society” – Code PE0000020
- **CUP:** J33C22002850006
- **Project manager:** Roberto Balzani
- **Project title:** Nineteenth-century sources in direct support of the digital visualization of objects, in the Museum and on the web. Tracing the Origins of the Capellini Museum in Bologna
- **Duration of contract:** 36 months
- **Brief description of the project:** The “RTD” will first have to participate in the structuring phase of the Virtual Technologies For Museums And Art Collections project, which aims at transferring not only technologies and applications, but also an innovative research model in the humanities field, through a close connection between sources and objects to several Italian museums. The case of the Capellini Museum in Bologna is particularly significant because of the vast amount of documentation available. It is therefore a matter of carrying out a precise survey of the sources; of articulating a meaningful architecture of the sources in the perspective of valorisation; of working closely with the Museum's conservators to identify a number of paths susceptible to digital narration; of participating in the realisation phase of the products; of producing qualitative evaluation elements, in order to determine the effect of the research on the organisation of the Museum's sources and on the enhancement of the valorisation activity.
- **Objective of the research project:** It is planned to produce a monograph or several articles in A-class academic journals. Cooperation with conservators and digital technologists is envisaged in order to set up a digital activity that can be experimented and realised in the Museum.
- **Admission requirement:** PhD



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- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 36

The specific elements of this procedure are as follows:

- **Department:** Department of Management - DiSA
- **SC:** 13/B1 – Business Administration and Accounting Studies
- **SSD:** SECS-P/07 – Business Administration and Accounting Studies
- **Number of positions:** 1
- **Main place of employment:** Forlì
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Code PE0000018
- **CUP:** J33C22002910001
- **Project manager:** Emanuele Padovani
- **Project title:** Social care services in the aftermath of Pandemic
- **Duration of contract:** 36 months
- **Brief description of the project:** The research project will address the research question of how to improve social care policies delivered by local governments, identifying which public and private actors are involved, how they are organized, and pointing out local best practices; a number of new performance indicators will be constructed so as to measure the level of effectiveness and efficiency at the national level, with also a comparative (within EU) perspective. The definition of the framework for performance and governance structure, and implementation of performance indicator dashboard for social care services for all Italian municipalities will be the focus of the research project. The project will be carried out in strict cooperation with the Osservatorio Nazionale Servizi Sociali Territoriali by CNEL – Consiglio Nazionale Economia e Lavoro, with whom the Department of Management already cooperates.
- **Objective of the research project:** The target to be reached at the end of the three years consists either in at least 1 article ranked in classes 3 or 4 according to the classification of the Journal Quality Guide of the Association of Business Schools (ABS), or in a cumulated SJR (SCIMAGO Journal Rank) index greater or equal to 2,3 or at least 12 Scopus citations in the last five years.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 37

The specific elements of this procedure are as follows:

- **Department:** Department of Management - DiSA
- **SC:** 13/B2 – Management
- **SSD:** SECS-P/08 – Management
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Code PE0000018
- **CUP:** J33C22002910001
- **Project manager:** Elisa Montaguti
- **Project title:** Bridging the gap between firms’ sustainable practices and consumers’ display of sustainable practice
- **Duration of contract:** 36 months
- **Brief description of the project:** The project aims to examine the central role played by consumers in the firms’ pursuit of sustainable transitions. This research plans to identify which firms’ practices are more likely to affect consumers’ display of sustainable actions and why; to pinpoint the channels and touchpoints that are more likely to affect engagement with sustainable practices and under which circumstances, to examine what is the role of consumer data, data protection, and consumer privacy in the adoption of sustainable practices. This project will involve the creation of a database mapping consumers’ online responses (e.g. engagement) to the introduction of sustainable practices by using web scraping and application programming interfaces.
- **Objective of the research project:** The target to be reached at the end of the three years consists either in at least 1 article ranked in classes 3 or 4 according to the classification of the Journal Quality Guide of the Association of Business Schools (ABS), or in a cumulated SJR (SCIMAGO Journal Rank) index greater or equal to 6,4 or at least 41 Scopus citations in the last five years.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 38

The specific elements of this procedure are as follows:

- **Department:** Department of Management - DiSA
- **SC:** 13/B4 – Financial Markets, Financial Institutions, and Corporate Finance
- **SSD:** SECS-P/09 – Corporate Finance
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Code PE0000018
- **CUP:** J33C22002910001
- **Project manager:** Mascia Bedendo
- **Project title:** Transition risk in Italian firms
- **Duration of contract:** 36 months
- **Brief description of the project:** The first part of the project involves mapping the exposure of Italian firms to transition risk, i.e. the risk of incurring losses in the process of adjusting towards a low-carbon economy. Such mapping will be based on a mix of information available for firms of different size, such as: (a) CO2 emission data and EU-taxonomy compliant disclosures, for large firms; (b) sector-based proxies for small and medium enterprises. The second part of the project involves comparing the characteristics of companies which are more or less exposed to transition risk (on a stand-alone basis or possibly combined with physical risk) to assess potential differences in terms of financing choices (capital and debt structure) and investment strategies across the two groups.
- **Objective of the research project:** The target to be reached at the end of the three years consists either in at least 1 article ranked in classes 3 or 4 according to the classification of the Journal Quality Guide of the Association of Business Schools (ABS), or in a cumulated SJR (SCIMAGO Journal Rank) index greater or equal to 3,3 or at least 25 Scopus citations in the last five years.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 39

The specific elements of this procedure are as follows:

- **Department:** Department of Sociology and Business Law - SDE
- **SC:** 14/C1 – General Sociology
- **SSD:** SPS/07 – General Sociology
- **Number of positions:** 1
- **Main place of employment:** Forlì
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Code PE0000018
- **CUP:** J33C22002910001
- **Project manager:** Alessandro Martelli
- **Project title:** Towards an equitable and sustainable well-being. Relevance and dynamics of social capital and socio-cultural participation for the development of social cohesion, inclusion and sustainability
- **Duration of contract:** 36 months
- **Brief description of the project:** Research activities firstly entail a reconstruction of the theoretical debate on social sustainability, social inclusion, and social cohesion in relation to well-being and fairness. This activity will be oriented towards the identification of relevant connections, overlaps and peculiarities of the considered literatures, as well as useful indicators. The researcher will also empirically investigate factors and dynamics which are relevant for the promotion of an equitable and sustainable well-being, paying specific attention to vulnerable populations and/or at risk of poverty and social exclusion subjects, such as young people and people in social and economic need. Theoretical and empirical activities will be informed by a gender-sensitive perspective.
- **Objective of the research project:** Publication of: at least a scientific monograph or 3 articles in A-rated scientific reviews (as per the Italian academic research evaluation agency – Anvur’s list) for the SPS/07 (General Sociology) scientific area; 1 article in a scientific review or in a scientific book; participation to national and international conferences.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 40

The specific elements of this procedure are as follows:

- **Department:** Department of Political and Social Sciences - SPS
- **SC:** 14/C2 – Sociology of Culture and Communication
- **SSD:** SPS/08 – Sociology of Culture and Communication
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Code PE000018
- **CUP:** J33C22002910001
- **Project manager:** Riccardo Prandini
- **Project title:** A geography of social (and cultural) capital in Italy
- **Duration of contract:** 36 months
- **Brief description of the project:** Literature review on the concept of social (and cultural) capital in order to investigate and conceptualize its drivers its links with concepts like trust, participation, cohesion, inclusion, well-being, quality of life, poverty, equity and development. To collect objective and subjective measures of social (and cultural) capital at regional, provincial and municipalities level in different time-points. To apply multivariate statistics to data collected in order to build subjective and objective indexes of social (and cultural) capital and investigate their relationship with the main analysis dimensions of the GRINS project. To select and analyze case studies at the municipal level to identify new forms of social capital in Italy. To contribute to the development of an open access database on social (and cultural) capital. The researcher will be called to carry out quantitative analysis of databases and data collection. The researcher will teach a total of 60 hours of classes.
- **Objective of the research project:** Proposal of at least 4 articles to national and international scientific journals, participation in an edited volume on the research activities, organization of an event for dissemination and discussion of research results, participation in at least one conference organized by recognized international/national scientific associations. The researcher will also actively participate to local research group meetings and to the organized meetings of the national spoke 8.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

ATTACHMENT 41

The specific elements of this procedure are as follows:

- **Department:** Department of Economics - DSE
- **SC:** 13/A1 – Economics
- **SSD:** SECS-P/01 – Economics
- **Number of positions:** 3
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 30
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** PNRR funds – Call PE – Project PE9 – GRINS “Growing Resilient, INclusive and Sustainable”, Code PE0000018
- **CUP:** J33C22002910001
- **Project manager:** Matteo Cervellati
- **Project title:** Resilient, inclusive and sustainable growth
- **Duration of contract:** 36 months
- **Brief description of the project:** Collecting and analyzing data regarding one or more of the following topics: firms’ sustainability, public sector performance, households’ sustainability, sustainable finance, innovation, low carbon policies, territorial sustainability, social sustainability.
- **Objective of the research project:** The objectives of scientific productivity of the researcher will be aimed, over the three-year period, at the production of at least 3 publications, including working papers, of which at least one published in international journals.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English