THE DIRECTOR

WITH REFERENCE TO the Programma Operativo Nazionale (PON) "Ricerca e Innovazione" 2014-2020 CCI2014IT16M2OP005 – of the Ministry of University and Research, approved by EC Decision C (2015) 4972 of July 14, 2015 and subsequent amendments

WITH REFERNCE TO the Programma Nazionale per la Ricerca (PNR) 2021-2027, approved by resolution of the Interministerial Committee for Economic Planning no. 74/2020 of 15 December 2020

WITH REFERNCE TO the Ministerial Decree 1062 of 10/08/2021 and the resources referred to in Annex 1 - Actions IV.4 - Doctorates and research contracts on innovation topics, equal to Euro 1,915,796.67 and IV.6 - Research contracts on Green topics, equal to Euro 8,473,716, 04

WITH REFERNCE TO the National Strategy for Smart Specialization 2014-2020 (SNSI) approved by the European Commission on 12 April 2016

WITH REFERENCE TO the notice published in the Official Gazette - 4th special series of 24/09/2021 which states that the University of Bologna will proceed on 15/10/2021 to publish selection for the assignment of fixed-term research contracts of type a), pursuant to law no. 240, article 24, paragraph 3, letter a) (RTDA) financed with funds of PON resources - Research and innovation 2014-2020

WITH REFERENCE TO the article 249 of Decree-law no. 34 of 19/05/2020

WITH REFERENCE TO the rules referred to in Article 14 of the present call for application

WITH REFERENCE TO the resolutions and decrees issued in September- October 2021 by the Departments for which the positions are activated

WITH REFERENCE TO the resolution of Board of Governors of September 28, 2021

ORDERS

Art. 1 – Purpose

Procedures of comparative evaluation by qualifications and public discussion are called for the recruitment of 78 researchers with a fixed-term employment contract full-time or defined-time for three-year pursuant to art. 24 paragraph 3 letter a) junior of Law no. 240/2010.

In case of full-time contract, the gross annual salary is € 36.344,00, whilst in case of defined-time contract the gross annual salary is € 26.367,00.

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 2014-2020 PON "Ricerca e Innovazione" and co-financed with the funds for the promotion and development of the policies of the Programma nazionale per la ricerca (PNR) referred to in Ministerial Decree 737 of 25/06/2021.

The specific elements of each position are defined in the relative attachment (an attachment to this call for applications has been prepared for each selection).
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 with a full-time contract will have to carry out 350 hours of supplementary teaching and assistance to students, for each academic year covered by the contract.
On the other hand, according to Ministerial Decree 1062 of 10/08/2021, researchers with a defined-time contract will carry out 250 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.
Concerning the provisions of art. 10 regarding fixed term researchers, issued by Rectoral Decree no. 344 of 29/03/2011 and amendments, the project that each winner will have to develop and the scientific productivity objectives are explained in the relative attachment.

Art. 3 – Research period in a company and research period abroad
During the 36 months of the contract, the winners will have to carry out a research period in a company from a minimum of 6 to a maximum of 12 months.
A research period abroad may also be provided, from a minimum of 6 to a maximum of 12 months.
Each attachment contains the indication of the period to be carried out in a company and abroad (the latter only if provided).
Even if not indicated in the attachment, the Departments may provide a research period abroad, to be carried out during the 36 months of the contract.

Art. 4 - 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 and, anyhow, considering the emergency situation, within January 20, 2022 from the publication of the approval decree of the procedure on the official university bulletin, otherwise the exclusion from the ranking occurs.
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. 5 – 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: November 3, 2021 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, o 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. 6 – 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. 7 – 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. 8 – 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 10 November 2021. The same 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. 9 – Ranking List and recruitment
With regard to each procedure, after the exams, the Board shall prepare the general final list based on the merits.
On equal merits, priority will be allocated according to date of birth and the youngest one shall prevail.
In the event that a procedure is held for two positions and two research projects or two venues are envisaged, the candidate placed first in the final list will have the right to choose the research project

to be performed or the venue (in case there is one project and two venues). The second candidate in the ranking will instead have to develop the remaining research project.
The list based on merits is approved pursuant to the 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 said notice in case the resolution has not been otherwise disclosed.
The use of the final candidate list is strictly bound to study and research needs related to the scientific sector provided for each procedure.
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 which, in any case, cannot be after 1st February 2022.

Art. 10 – 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.
At the time of signing the contract, the winners will be invited to sign a declaration stating: a) they formally undertake to carry out the required research periods (minimum 6 months, maximum 12 months) in the company and abroad (optional), at the same time certifying to be aware that failure to comply with the minimum term of the undertaking period will result in the revocation of the research contract; b) to be aware that the intervention is co-financed by the European Social Fund REACT EU - Programma Operativo Nazionale Ricerca e Innovazione 2014-2020, owned by the Ministry of University and Research; c) to be aware that failure to comply with the requirements of Ministerial Decree 1062 of August 10, 2021 for the allocation of resources of the specification attached to the Ministerial Decree entails the revocation of the approved intervention and the full refund of the amounts received; d) to be aware that the modification of the project objectives and the expected results (if not previously authorized by the MUR) involves the revocation of the approved intervention and the full refund of the amounts already received.
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. 11 – 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. 12 - 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. 13 - 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 Raffaeli, 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 2099617 – 2098958 - 2098972, Fax 051 2086163; e-mail: apos.ricercatoritempodeterminato@unibo.it .

Art.14 - 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).

Per Il Dirigente dell'Area del Personale
f.to digitalmente Giovanni Longo

Attached documents:
- Summary table of activated positions;
- Attachment 1 – Dept. Architecture - DA, SSD ICAR/11, 1 position;
- Attachment 2 - Dept. Architecture - DA, SSD ICAR/20, 1 position;
- Attachment 3 – Dept. Cultural Heritage - DBC, SSD L-ANT/09, 1 position;
- Attachment 4 – Dept. Chemistry "Giacomo Ciamician" - CHIM, SSD CHIM/03, 1 position;
- Attachment 5 – Dept. Chemistry "Giacomo Ciamician" - CHIM, SSD CHIM/06, 1 position;
- Attachment 6 – Dept. Industrial Chemistry "Toso Montanari" - CHIMIND, SSD CHIM/02, 1 position;
- Attachment 7 – Dept. Industrial Chemistry "Toso Montanari" - CHIMIND, SSD CHIM/04, 1 position;
- Attachment 8 – Dept. of The Arts - DAR, SSD L-ART/02, 1 position;

- Attachment 9 – Dept. of The Arts - DAR, SSD L-ART/08, 1 position;
- Attachment 10 – Dept. Pharmacy and Biotechnology - FaBiT, SSD MAT/03, 1 position;
- Attachment 11 – Dept. Pharmacy and Biotechnology - FaBiT, SSD BIO/18, 1 position;
- Attachment 12 – Dept. Pharmacy and Biotechnology - FaBiT, SSD CHIM/10, 1 position;
- Attachment 13 – Dept. Classical Philology and Italian Studies - FICLIT, SSD M-STO/09, 1 position;
- Attachment 14 – Dept. Classical Philology and Italian Studies - FICLIT, SSD L-FIL-LET/04, 1 position;
- Attachment 15 – Dept. Classical Philology and Italian Studies - FICLIT, SSD L-LIN/01, 1 position;
- Attachment 16 – Dept. Philosophy and Communication Studies - FILCOM, SSD M-PSI/01, 1 position;
- Attachment 17 – Dept. Philosophy and Communication Studies - FILCOM and Dept. Sociology and Business Law - SDE, SSD SPS/08, 2 positions;
- Attachment 18 – Dept. Physics and Astronomy “Augusto Righi” - DIFA, SSD FIS/03, 1 position;
- Attachment 19 – Dept. Physics and Astronomy “Augusto Righi” - DIFA, SSD FIS/06, 1 position;
- Attachment 20 – Dept. Physics and Astronomy “Augusto Righi” - DIFA, SSD FIS/07, 1 position;
- Attachment 21 – Dept. Computer Science and Engineering - DISI, SSD ING-INF/05, 1 position;
- Attachment 22 – Dept. Civil, Chemical, Environmental, and Materials Engineering - DICAM, SSD ING-IND/22, 1 position;
- Attachment 23 – Dept. Civil, Chemical, Environmental, and Materials Engineering - DICAM, SSD ING-IND/25, 1 position;
- Attachment 24 – Dept. Civil, Chemical, Environmental, and Materials Engineering - DICAM, SSD ICAR/04, 1 position;
- Attachment 25 – Dept. Electrical, Electronic, and Information Engineering "Guglielmo Marconi" - DEI, SSD ING-IND/31, 1 position;
- Attachment 26 – Dept. Electrical, Electronic, and Information Engineering "Guglielmo Marconi" - DEI, SSD ING-INF/03, 1 position;
- Attachment 27 – Dept. Electrical, Electronic, and Information Engineering "Guglielmo Marconi" - DEI, SSD ING-INF/04, 1 position;
- Attachment 28 – Dept. Industrial Engineering - DIN, SSD ING-IND/10, 1 position;
- Attachment 29 – Dept. Industrial Engineering - DIN, SSD ING-IND/13, 1 position;
- Attachment 30 – Dept. Industrial Engineering - DIN, SSD ING-IND/15, 1 position;
- Attachment 31 – Dept. Interpreting and Translation - DIT and Dept. Modern Languages, Literatures, and Cultures - LILEC, SSD L-LIN/04, 2 positions;
- Attachment 32 – Dept. Modern Languages, Literatures, and Cultures - LILEC, SSD L-LIN/12, 1 position;
- Attachment 33 – Dept. Mathematics - MAT, SSD MAT/06, 1 position;
- Attachment 34 – Dept. Mathematics - MAT, SSD MAT/07, 1 position;
- Attachment 35 – Dept. Mathematics - MAT, SSD MAT/09, 1 position;
- Attachment 36 – Dept. Experimental, Diagnostic and Specialty Medicine - DIMES, SSD MED/06, 1 position;
- Attachment 37 – Dept. Experimental, Diagnostic and Specialty Medicine - DIMES, SSD MED/14, 1 position;
- Attachment 38 – Dept. Experimental, Diagnostic and Specialty Medicine - DIMES, SSD MED/30, 1 position;
- Attachment 39 – Dept. Management - DiSA, SSD SECS-P/09, 1 position;

- Attachment 40 – Dept. Management - DiSA, SSD SECS-P/11, 1 position;
- Attachment 41 – Dip. Scienze Biologiche, Geologiche e Ambientali – BIGEA, SSD GEO/09, 1 position;
- Attachment 42 – Dept. Biological, Geological, and Environmental Sciences - BIGEA, SSD BIO/05, 1 position;
- Attachment 43 – Dept. Biomedical and Neuromotor Sciences - DIBINEM, SSD BIO/09, 1 position;
- Attachment 44 – Dept. Biomedical and Neuromotor Sciences - DIBINEM, SSD BIO/16, 1 position;
- Attachment 45 – Dept. Biomedical and Neuromotor Sciences - DIBINEM, SSD MED/26, 1 position;
- Attachment 46 – Dept. Biomedical and Neuromotor Sciences - DIBINEM, SSD MED/28, 1 position;
- Attachment 47 – Dept. Education Studies "Giovanni Maria Bertin" - EDU, SSD M-PED/01, 2 positions;
- Attachment 48 – Dept. Education Studies "Giovanni Maria Bertin" - EDU, SSD M-PED/03, 1 position;
- Attachment 49 – Dept. Agricultural and Food Sciences - DISTAL, SSD AGR/03, 1 position;
- Attachment 50 – Dept. Agricultural and Food Sciences - DISTAL, SSD AGR/07, 1 position;
- Attachment 51 – Dept. Agricultural and Food Sciences - DISTAL, SSD AGR/11, 1 position;
- Attachment 52 – Dept. Agricultural and Food Sciences - DISTAL, SSD AGR/17, 1 position;
- Attachment 53 – Dept. Economics - DSE, SSD SECS-P/01, 1 position;
- Attachment 54 – Dept. Economics - DSE and Dept. Statistical Sciences "Paolo Fortunati" - STAT, SSD SECS-P/02, 2 positions;
- Attachment 55 – Dept. Economics - DSE, SSD SECS-P/05, 1 position;
- Attachment 56 – Dept. Legal Studies - DSG, SSD IUS/01, 1 position;
- Attachment 57 – Dept. Legal Studies - DSG, SSD IUS/02, 1 position;
- Attachment 58 – Dept. Legal Studies - DSG, SSD IUS/15, 1 position;
- Attachment 59 – Dept. Legal Studies - DSG, SSD IUS/20, 1 position;
- Attachment 60 – Dept. Medical and Surgical Sciences - DIMEC, SSD MED/03, 1 position;
- Attachment 61 – Dept. Medical and Surgical Sciences - DIMEC, SSD MED/44, 1 position;
- Attachment 62 – Dept. Medical and Surgical Sciences - DIMEC, SSD BIO/14, 1 position;
- Attachment 63 – Dept. Veterinary Medical Sciences - DIMEVET, SSD VET/04, 1 position;
- Attachment 64 – Dept. Veterinary Medical Sciences - DIMEVET and Dept. for Life Quality Studies - QUVI, SSD VET/08, 2 positions;
- Attachment 65 – Dept. Veterinary Medical Sciences - DIMEVET, SSD VET/10, 1 position;
- Attachment 66 – Dept. for Life Quality Studies - QUVI, SSD BIO/15, 1 position;
- Attachment 67 – Dept. Political and Social Sciences - SPS, SSD SPS/04, 1 position;
- Attachment 68 – Dept. Political and Social Sciences - SPS, SSD SPS/07, 1 position;
- Attachment 69 – Dept. Political and Social Sciences - SPS, SSD SPS/14, 1 position;
- Attachment 70 – Dept. Sociology and Business Law - SDE, SSD IUS/03; 1 position;
- Attachment 71 - Dept. History and Cultures - DiSCi, SSD L-ANT/03, 1 position;
- Attachment 72 - Dept. History and Cultures - DiSCi, SSD L-ANT/10, 1 position;
- Attachment 73 - Dept. History and Cultures - DiSCi, SSD M-GGR/01, 1 position.

Department	SC (Sector competition reference)	SSD (Scientific sector)	Number of positions	Contract type (fulltime/defined time)	Place of employment	Scientific director
Architecture - DA	08/C1	ICAR/11	1	full time	Ravenna	MARCO ALVISE BRAGADIN
Architecture - DA	08/F1	ICAR/20	1	full time	Bologna	SIMONA TONDELLI
Cultural Heritage - DBC	10/A1	L-ANT/09	1	full time	Ravenna	GIUSEPPE LEPORE
Chemistry "Giacomo Ciamician" - CHIM	03/B1	CHIM/03	1	full time	Bologna	GIUSEPPE FALINI
Chemistry "Giacomo Ciamician" - CHIM	03/C1	CHIM/06	1	full time	Bologna	MARCO LUCARINI
Industrial Chemistry "Toso Montanari" - CHIMIND	03/A2	CHIM/02	1	full time	Ravenna	ELISABETTA VENUTI
Industrial Chemistry "Toso Montanari" - CHIMIND	03/C2	CHIM/04	1	full time	Bologna	FRANCESCO BASILE
of the Arts - DAR	10/B1	L-ART/02	1	full time	Bologna	DANIELE BENATI
of the Arts - DAR	10/C1	L-ART/08	1	full time	Bologna	DOMENICO STAITI
Pharmacy and Biotechnology - FaBiT	01/A2	MAT/03	1	full time	Bologna	RITA FIORESI
Pharmacy and Biotechnology - FaBiT	05/I1	BIO/18	1	full time	Bologna	FEDERICO MANUEL GIORGI
Pharmacy and Biotechnology - FaBiT	03/D1	CHIM/10	1	full time	Bologna	ROBERTA BUDRIESI
Classical Philology and Italian Studies - FICLIT	11/A4	M-STO/09	1	full time	Bologna	MADDALENA MODESTI
Classical Philology and Italian Studies - FICLIT	10/D3	L-FIL-LET/04	1	full time	Bologna	FRANCESCO CITTI
Classical Philology and Italian Studies - FICLIT	10/G1	L-LIN/01	1	full time	Bologna	EMANUELE MIOLA
Philosophy and Communication Studies - FILCOM	11/E1	M-PSI/01	1	full time	Bologna	LUISA LUGLI
Philosophy and Communication Studies - FILCOM and Sociology and Business Law - SDE	14/C2	SPS/08	2	full time	Bologna	ANNALISA PELIZZA/PAOLA PARMIGGIANI
Physics and Astronomy “Augusto Righi” - DIFA	02/B1	FIS/03	1	full time	Bologna	DANIELA CAVALCOLI
Physics and Astronomy “Augusto Righi” - DIFA	02/C1	FIS/06	1	full time	Bologna	SILVANA DI SABATINO
Physics and Astronomy “Augusto Righi” - DIFA	02/D1	FIS/07	1	full time	Ravenna	ANDREA CONTIN
Computer Science and Engineering - DISI	09/H1	ING-INF/05	1	full time	Cesena	MIRKO VIROLI
Civil, Chemical, Environmental, and Materials Engineering - DICAM	09/D1	ING-IND/22	1	full time	Bologna	MARIA BIGNOZZI
Civil, Chemical, Environmental, and Materials Engineering - DICAM	09/D3	ING-IND/25	1	full time	Bologna	VALERIO COZZANI
Civil, Chemical, Environmental, and Materials Engineering - DICAM	08/A3	ICAR/04	1	full time	Bologna	CESARE SANGIORGI
Electrical, Electronic, and Information Engineering "Guglielmo Marconi" - DEI	09/E1	ING-IND/31	1	full time	Bologna	GABRIELE GRANDI
Electrical, Electronic, and Information Engineering "Guglielmo Marconi" - DEI	09/F2	ING-INF/03	1	full time	Bologna	DAVIDE DARDARI
Electrical, Electronic, and Information Engineering "Guglielmo Marconi" - DEI	09/G1	ING-INF/04	1	full time	Bologna	LORENZO MARCONI
Industrial Engineering - DIN	09/C2	ING-IND/10	1	full time	Bologna	GIAN LUCA MORINI
Industrial Engineering - DIN	09/A2	ING-IND/13	1	full time	Bologna	MARCO CARRICATO
Industrial Engineering - DIN	09/A3	ING-IND/15	1	full time	Bologna	ALFREDO LIVERANI
Interpreting and Translation - DIT and Modern Languages, Literatures, and Cultures - LILEC	10/H1	L-LIN/04	2	full time	Forlì/Bologna	DANIO MALDUSSI/PAOLA PUCCINI
Modern Languages, Literatures, and Cultures - LILEC	10/L1	L-LIN/12	1	full time	Bologna	MONICA TURCI
Mathematics - MAT	01/A3	MAT/06	1	full time	Bologna	STEFANO PAGLIARANI
Mathematics - MAT	01/A4	MAT/07	1	full time	Bologna	PIERLUIGI CONTUCCI
Mathematics - MAT	01/A6	MAT/09	1	full time	Cesena	MARCO ANTONIO BOSCHETTI
Experimental, Diagnostic and Specialty Medicine - DIMES	06/D3	MED/06	1	full time	Bologna	ANDREA ARDIZZONI
Experimental, Diagnostic and Specialty Medicine - DIMES	06/D2	MED/14	1	full time	Bologna	GAETANO LA MANNA
Experimental, Diagnostic and Specialty Medicine - DIMES	06/F2	MED/30	1	full time	Bologna	PIERA VERSURA
Management - DiSA	13/B4	SECS-P/09	1	full time	Bologna	MASCIA BEDENDO

Management - DiSA	13/B4	SECS-P/11	1	full time	Forlì	GIUSEPPE TORLUCCIO
Biological, Geological, and Environmental Sciences - BIGEA	04/A1	GEO/09	1	full time	Bologna	PAOLO GAROFALO
Biological, Geological, and Environmental Sciences - BIGEA	05/B1	BIO/05	1	full time	Ravenna	ALESSIA CARIANI
Biomedical and Neuromotor Sciences - DIBINEM	05/D1	BIO/09	1	full time	Bologna	PATRIZIA FATTORI
Biomedical and Neuromotor Sciences - DIBINEM	05/H1	BIO/16	1	full time	Bologna	MATILDE YUNG FOLLO
Biomedical and Neuromotor Sciences - DIBINEM	06/D6	MED/26	1	full time	Bologna	ROCCO LIGUORI
Biomedical and Neuromotor Sciences - DIBINEM	06/F1	MED/28	1	full time	Bologna	LORENZO BRESCHI
Education Studies "Giovanni Maria Bertin" - EDU	11/D1	M-PED/01	2	full time	Bologna/Rimini	MAURIZIO FABBRI
Education Studies "Giovanni Maria Bertin" - EDU	11/D2	M-PED/03	1	full time	Bologna	CHIARA PANCIROLI
Agricultural and Food Sciences - DISTAL	07/B2	AGR/03	1	full time	Bologna	ILARIA FILIPPETTI
Agricultural and Food Sciences - DISTAL	07/E1	AGR/07	1	full time	Bologna	SILVIO SALVI
Agricultural and Food Sciences - DISTAL	07/D1	AGR/11	1	full time	Bologna	GIOVANNI BURGIO
Agricultural and Food Sciences - DISTAL	07/G1	AGR/17	1	full time	Bologna	LUCA FONTANESI
Economics - DSE	13/A1	SECS-P/01	1	full time	Bologna	ANTONELLO EUGENIO SCORCU
Economics - DSE and Statistical Sciences "Paolo Fortunati" - STAT	13/A2	SECS-P/02	2	full time	Rimini	PAOLO FIGINI/MASSIMILIANO CASTELLANI
Economics - DSE	13/A5	SECS-P/05	1	full time	Bologna	GIUSEPPE CAVALIERE
Legal Studies - DSG	12/A1	IUS/01	1	full time	Bologna	DANIELA MEMMO
Legal Studies - DSG	12/E2	IUS/02	1	defined time	Bologna	MARINA TIMOTEO
Legal Studies - DSG	12/F1	IUS/15	1	full time	Bologna	ELENA ZUCCONI GALLI FONSECA
Legal Studies - DSG	12/H3	IUS/20	1	full time	Ravenna	MONICA PALMIRANI
Medical and Surgical Sciences - DIMEC	06/A1	MED/03	1	full time	Bologna	GIUSEPPE GASPARRE
Medical and Surgical Sciences - DIMEC	06/M2	MED/44	1	full time	Bologna	PAOLO BOFFETTA
Medical and Surgical Sciences - DIMEC	05/G1	BIO/14	1	full time	Bologna	ELISABETTA POLUZZI
Veterinary Medical Sciences - DIMEVET	07/H2	VET/04	1	full time	Bologna	ALESSANDRA DE CESARE
Veterinary Medical Sciences - DIMEVET and for Life Quality Studies - QUVI	07/H4	VET/08	2	full time	Bologna/Rimini	FEDERICO FRACASSI/ANGELO PELI
Veterinary Medical Sciences - DIMEVET	07/H5	VET/10	1	full time	Bologna	CAROLINA CASTAGNETTI
for Life Quality Studies - QUVI	05/A1	BIO/15	1	full time	Rimini	FABIANA ANTOGNONI
Political and Social Sciences - SPS	14/A2	SPS/04	1	full time	Bologna	GIAMPIERO GIACOMELLO
Political and Social Sciences - SPS	14/C1	SPS/07	1	full time	Bologna	NICOLA DE LUIGI
Political and Social Sciences - SPS	14/B2	SPS/14	1	full time	Bologna	MASSIMILIANO TRENTIN
Sociology and Business Law - SDE	12/E3	IUS/03	1	full time	Bologna	CLAUDIA GOLINO
History and Cultures - DiSCi	10/D1	L-ANT/03	1	full time	Bologna	FRANCESCA CENERINI
History and Cultures - DiSCi	10/A1	L-ANT/10	1	full time	Bologna	ANDREA AUGENTI
History and Cultures - DiSCi	11/B1	M-GGR/01	1	full time	Bologna	CLAUDIO MINCA

ATTACHMENT 1

The specific elements of this procedure are as follows:

- **Department:** Department of Architecture - DA
- **SC**: 08/C1 – DESIGN AND TECHNOLOGICAL PLANNING OF ARCHITECTURE
- **SSD**: ICAR/11 – BUILDING PRODUCTION
- **Number of positions**: 1
- **Thematic area**: Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Grande ambito di ricerca: 5.4 Digitale, industria, aerospazio Ambito tematico: 5.4.1 Transizione Digitale - I4.0 - Articolazioni di ricerca: Articolazione 2. Comunità sostenibili.
- **Main place of employment**: Ravenna
- **Contract type**: Full-time
- **Project title**: Design and experimentation of digital technologies for the study of climate change effects on the built environment.
- **Brief description of the project**: The research activities concern the design and testing of BIM (Building Information Modeling) technologies for assessing the effects of climate change on the built environment, deepened at the building scale. The research focuses not only to the production of parametric models with a semantic structure, which can be developed with digital technologies related to BIM, but also to defining methods, criteria and tools for the application of digital technologies to evaluate the effects of changes in the climatic conditions over the entire life cycle of the building, from the design and construction to the operation and maintenance phase up to the final demolition / renovation. The research will include the analysis of the critical points and strengths of digital technologies to propose theoretical and practical solutions suitable for assessing the effects of climate change on buildings.
- **Objective of the research project**: The researcher will be involved in the following activities: 1. Modeling of building information relating to the effects of climate change on buildings, through the preparation of specific information for carrying out the assessment of the effects of climate change for construction and facility management. This includes all the components useful for identifying, producing, managing and transmitting information; 2. Analysis of the technological aspects of the data digitization relating to the effects of climate change on the life cycle of buildings. 3. Experimentation of a collaborative digital BIM environment for the evaluation of the effects of climate change in construction projects. 4. The researcher must be the author or co-author of at least two scientific articles in international journals rated in class A by the ANVUR range or indexed.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department**.**
- **Research period abroad**: A research period abroad of 6-12 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 2

The specific elements of this procedure are as follows:

- **Department:** Department of Architecture - DA
- **SC:** 08/F1 – URBAN AND TERRITORIAL PLANNING AND DESIGN
- **SSD**: ICAR/20 – URBAN AND REGIONAL PLANNING
- **Number of positions**: 1
- **Thematic area**: Green
- **Thematic area SNSI:** Agenda digitale, smart communities, sistemi di mobilità intelligente.
- **Areas of development of the project SNSI:** Sistemi per la sicurezza dell'ambiente urbano, il monitoraggio ambientale e la prevenzione di eventi critici o di rischio.
- **PNR topics and articulations:** Grande ambito di ricerca: 5.5 Clima, energia, mobilità sostenibile - Area di intervento: 5.5.2 Cambiamento climatico, mitigazione e adattamento; Grande ambito di ricerca: Cultura Umanistica, Creatività, Trasformazioni Sociali, Società Dell'inclusione - Articolazione 3. Disuguaglianze e inclusione; Articolazione 4. Nuove identità e processi culturali; Articolazione 5. Benessere psico-sociale e qualità della vita.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Nature-based solutions for climate resilient and just societies: an interdisciplinary approach to integrate greening and justice into local policies and planning tools.
- **Brief description of the project:** Research on complex socio-ecological (urban, coastal or rural) systems led through the analysis of the relationships between natural, technical and socio-cultural ecosystems, including the concept of ecological transition in terms of environmental and social resilience, with reference also to the overcoming of effects of the crisis in the context of the COVID-19 pandemic. The researcher should develop methodologies for evaluating nature-based solutions in terms of climate, social and environmental justice, contributing to the definition of new solutions to improve the resilience of communities through the improvement and management of environmental resources and the definition of integrated policies.
- **Objective of the research project:** The research aims to create a high added value in terms of scientific, social and human capital related consequences. In terms of scientific productivity, the researcher must be the author or co-author of at least two scientific articles in journals ranked as A in the ANVUR range or indexed. Furthermore, he/she will have to actively collaborate in the presentation of competitive projects at national and international level on the topics covered by the announcement (min. 3 proposals presented in the three-year period). With reference to the social impact, in the framework of co-creation and involvement of communities, the researcher will be asked creating contacts and collaborations with public bodies (municipalities, metropolitan cities, regions) and private entities (NGOs, companies) organizing meetings, trainings and workshops on the issues of climate adaptation, ecological transition and climate justice, thus contributing to the objectives of the University's Third Mission.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the department**.**
- **Research period abroad**: A research period abroad of 6-12 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 3

The specific elements of this procedure are as follows:

- **Department**: Department of Cultural Heritage - DBC
- **SC**: 10/A1 - ARCHAEOLOGY
- **SSD**: L-ANT/09 - ANCIENT TOPOGRAPHY
- **Number of positions**: 1
- **Thematic area**: Green
- **Area tematica SNSI:** 5.4.5 -Turismo, Patrimonio culturale e industria della creatività
- **Traiettoria di sviluppo del progetto SNSI:** Sistemi e applicazioni per il turismo, la fruizione della cultura e l'attrattività del Made in Italy.
- **Ambiti e articolazioni PNR:** 5.2.3 Antichistica, Articolazione 3. Paesaggi culturali: alle origini delle tradizioni.
- **Main place of employment:** Ravenna
- **Contract type:** Full-time
- **Project title:** Multidisciplinary investigation of maritime archaeological heritage as an indicator of the responses of ancient communities on the Emilia-Romagna coast to environmental changes and as a resource for developing sustainable tourism for Green recovery.
- **Brief description of the project:** Archaeological multidisciplinary study of significant cases in which submerged and non-submerged evidence relates to changes in the littoral environment due to climatic variations and human intervention, highlighted by geomorphological and palaeo-environmental investigations, as historical examples of strategies to manage changes and the exploitation of resources. Study of means and techniques of ancient navigation on the Emilia-Romagna coast between maritime archaeology, history, anthropology, as an example of sustainable approach in the relationship with the environment. Production of materials for the development of sustainable tourism, focusing on themes of maritime archaeology, history and nautical, industrial, environmental and migration anthropology, and on the socio-cultural and environmental relations of the sea with the productive reality, added value with positive effects on the social and economic field and on the conservation of the ecosystem, with quantifiable targets.
- **Objective of the research project:** Compilation and acceptance for publication of three articles in class A journals on the work carried out in the project, with emphasis on multidisciplinarity; Participation with papers in three congresses in the field of 'Maritime Archaeology'; Organisation of a workshop, with the participation of specialists from the disciplines involved, underwater archaeologists, marine biologists, geomorphologists, physical and cultural anthropologists, historians, philologists, together with local bodies, on the contribution that information from research into the past makes to a better management of environmental changes; Creation of a virtual interactive "portolan chart" (guide-book) on the maritime cultural heritage of the Emilia-Romagna coastline, including environment, archaeology, history and anthropology, intended to guide and develop selected and sustainable tourism in the involved territories, as a tool to promote green recovery and overcome the effects of the COVID-19 pandemic.
- **Number of hours of frontal teaching per year:** 60
- **Admission requirement:** Phd
- **Maximum number of publications:** 18
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the department**.**

ATTACHMENT 4

The specific elements of this procedure are as follows:

- **Department**: Department of Chemistry "Giacomo Ciamician" – CHIM
- **SC**: 03/B1 - PRINCIPLES OF CHEMISTRY AND INORGANIC SYSTEMS
- **SSD:** CHIM/03 - GENERAL AND INORGANIC CHEMISTRY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Materiali innovativi ed ecocompatibili.
- **PNR topics and articulations:** 5.6.1 Green technologies, ambiente; articolazione 4: Riduzione dei rifiuti e della domanda di critical raw materials tramite approcci di disassembling e materials recovery, remanufacturing e refurbishing.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Recovery and valorization of waste shells from fishery and aquaculture: from understanding to application.
- **Brief description of the project:** Every year, some 6 to 8 million ton of waste shells from fishery and aquaculture are produced globally. They are often dumped in the environment or their disposal is costly. Shells are composite biomaterials resulting from evolution, made of chitin, calcium carbonate and protein, with a hierarchical structure and astonishing (e.g. mechanical) properties. The researcher will carry out activities for their valorization. She/he will investigate the structure of waste seashells (e.g. squid pens) and develop green synthetic strategies that preserve the natural micro- and nano-structure, not obtainable through laboratory synthesis. Research will mainly, but not only, focus on chitin-based waste. These hierarchical structures will be chemically functionalized to add new properties not found in nature. This will enable the production of novel, biocompatible and antibacterial materials and compounds with advanced mechanical properties for a variety of applications, mainly in materials science.
- **Objective of the research project**: Over the three-year period, the researcher's scientific productivity objectives will be aimed at producing publications in international peer-reviewed journals, listed by the Institute for Scientific Information (ISI WoK), in number of at least 6 publications over the three-year period, of which at least 3 as the first or corresponding author, as well as the presentation of the results obtained at national and/or international scientific conferences. The researcher will also have to play an active role in the preparation of project proposals and in participation in national and international research projects. Objectives of the research activities will be realized in accordance.
- **Number of hours of frontal teaching per year:** 40
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of research of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 5

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
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Materiali innovativi ed ecocompatibili.
- **PNR topics and articulations:** Grande Ambito: Prodotti Alimentari, Bioeconomia, Risorse Naturali, Agricoltura, Ambiente Ambito: Green technologies Articolazione 1: Biochemicals, bioprodotti e processi chimici sostenibili in sinergia con biofuels, bioenergy e agro-energie.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Study and characterization of organic radical intermediates in the context of sustainable chemical processes.
- **Brief description of the project:** Science of macromolecules, including polymers, constituent components of plastic materials, have deeply revolutionized our society, paving the way to myriads of possibility and applications. As already known, however, their large employment determined a high impact from the environmental point of view, that rises concern in the community. Organic free radicals play a central role in macromolecule science, particularly in the polymers field, as they are involved in their degradation processes. The project, which involve the collaboration of an industry working on the development of stabilizers for polymeric materials, will be focused on the study of new radical processes of stabilization and degradation of high molecular weight materials. It will have the objective to modify the lifetime of plastic materials with the obvious and evident goal of conferring a major sustainability and eco-compatibility to these materials.
- **Objective of the research project**: During the three years the scientific productivity objectives of the researcher will be aimed to the production of publication on international peer-reviewed journals, surveyed by the Institute for Scientific Information (ISI WoK), in addition to the presentation of the obtained results in national and/or international conferences. The researcher will have also to play an active role in writing project proposal and in the participation in national and international research projects. Scientific productivity objectives will be accomplished according to the green themes explained above.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of research of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 6

The specific elements of this procedure are as follows:

- **Department:** Department of Industrial Chemistry “Toso Montanari” - CHIMIND
- **SC:** 03/A2 - MODELS AND METHODS FOR CHEMISTRY
- **SSD:** CHIM/02 - PHYSICAL CHEMISTRY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Smart and Sustainable Industry, Energy and Environment.
- **Areas of development of the project SNSI:** Innovative production processes with high efficiency and for industrial sustainability Evolutionary and adaptive production systems for customized production Innovative and environmentally friendly materials.
- **PNR topics and articulations:** MAJOR SCOPE OF RESEARCH AND INNOVATION: 5.5 CLIMATE, ENERGY, SUSTAINABLE MOBILITY 5.5.3 Industrial energy Articulation 3. Decarbonization of industry: local production from RES, efficient use and sustainable energy and materials, transformation of energy vectors.
- **Main place of employment:** Ravenna
- **Contract type:** Full-time
- **Project title:** Spectroscopic characterization of the interaction of gas molecules with novel porous materials for applications in gas storage and sensors for pollutant detection.
- **Brief description of the project:** RTD’s research activity will focus on MOFs and COFs systems with promising features in gas storage and as sensors, acquired in the framework of collaborations with other research groups. The employment of growth methods for bulk and/or film phase samples as well as of structural and morphological analysis techniques is envisaged. Solid state spectroscopy techniques, including FarIR with synchrotron radiation and micro-Raman at low wavelengths, also under conditions of high temperatures and pressures, will be employed for structural characterizations and for the investigation of the material adsorption processes. The study will focus on systems that can be used in optical, electrochemical, and field-effect transistor sensors. The RTD will operate independently on the aforementioned topics. For the research activity at the company, development of sensors and / or spectroscopic techniques is envisaged.
- **Objective of the research project:** Over the three-year time span, the publication of at least 5 works in international peer-reviewed journals is requested, on the topics of the research activity and within the scientific sector CHIM02. Attendance to at least 3 national and international meetings through presentation of posters and oral communications is also required. A research stay of 6 months abroad is envisaged.
- **Number of hours of frontal teaching per year:** 40
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of 6 months of research in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A period of 6 months of research abroad is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 7

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
- **Thematic area:** Green
- **Thematic Area SNSI and areas of development of the project:** Smart and sustainable industry, energy and environment; Technologies for smart grids, renewable sources and distributed generation.
- **PNR topics and articulations:** CLIMATE, ENERGY, SUSTAINABLE MOBILITY: Industrial energy, Articulation 3. Decarbonization of industry: local production from FER, efficient use and sustainable energy and materials, transformation of energy carriers (where there are energy carriers such as methane and methanol).
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Development of chemical processes, catalytic technologies and materials for the transformation of renewable resources, the production and use of hydrogen and energy carriers and the conversion of CO2.
- **Brief description of the project:** The RTD will be engaged in areas related to the green issues of the PNR and will contribute to the policies and targets of the green deal and the fit for 55 pack. In particular, the researcher will deal with the efficient use of biomass to produce chemicals and biofuels in a circular economy perspective, the production and use of hydrogen and energy carriers and the conversion of renewable energy and capture and the transformation of CO2. The researcher will develop research and development activities in close contact with industry using the approaches of industrial chemistry with particular reference to the development of processes, the synthesis and application of catalysts and the study of catalytic processes, the development of chemical technologies and materials for energy and the development of solutions to reduce the environmental impact. The researcher will contribute to the teaching of industrial chemistry, of green chemistry and sustainable chemical technologies.
- **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.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 8

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
- **Thematic area**: Innovation
- **Thematic Area SNSI**: Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici.
- **PNR topics and articulations:** Ambito Discipline storiche, letterarie e artistiche Articolazione 4. Interpretazione del patrimonio culturale e transizione digitale.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Digital Renaissance. Recovery and enhancement of lost cultural identities through new digital technologies.
- **Brief description of the project:** The winner will carry out research utilizing digital resources and the Web with the aim of enhancing and better utilizing the work of reconstruction of a "lost" context, in this case the urban reality of recognized historic relevance that was the Bologna governed by the Bentivoglio family. This prototype can then be adapted to other situations. The goal is to provide programmers with the skills to develop maps with explorable OpenStreetMap levels, to be implemented with additional supplementary apps, which will allow users to access in-depth paths, 3D reconstructions, virtual tours, video stories. Digital tools that, in addition to the tourism promotion, have a significant role in increasing the awareness of local residents regarding the urban areas that they live in. After a systematic census of the environments, the material artefacts and the main historical figures, the data collected must be able to flow into an interoperable and open data digital platform accessible online.
- **Objective of the research project:** During the period of the contract, the researcher is expected to: - publish three articles in scientific journals or collective volumes of high scientific profile, or as monograph - participate in two scientific meetings or conventions - have a direct collaboration in the organization and management of the interoperable digital and open data platform, intended as Content Management System, that is integrated and accessible online. During the period of the contract, the researcher is expected to: - collaborate in the teaching activities of the department, carrying out lessons in person (min. 30 hours), seminars or laboratories and support activities for students, according to the department rules; - collaborate in organizational activities of the Department.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 9

The specific elements of this procedure are as follows:

- **Department:** Department of The Arts - DAR
- **SC:** 10/C1 - CINEMA, MUSIC, PERFORMING ARTS, TELEVISION AND MEDIA STUDIES
- **SSD:** L-ART/08 – ETHNOMUSICOLGY
- **Number of positions:** 1
- **Area tematica:** Green
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici.
- **PNR topics and articulations:** Ambito Discipline storiche, letterarie e artistiche Articolazione 3 Discipline umanistiche, ambiente e sostenibilità.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Sound of silence. Ecoacoustic mapping of the impacts of certain human activities on natural environment and places fruition.
- **Brief description of the project:** The RTD will carry out research on the impacts which certain sound events have on biodiversity and places fruition in areas of natural and cultural interest. The study encompasses the designation of physical and subjective parameters useful for the collection of quantitative and qualitative data; the evaluation of sound pressure levels; the on-site assessment of phonometric measurements to monitor the impact of the antropophonies on the biophonies. The data-flow will actively involve a sector leading company selected among those which expressed their interest. Sound quality maps will be created and made accessible and updatable by users through an open data web interface, thus enabling citizen science experiences. The Research Fellow will spend 6 months at the selected company in order to synergistically design the web interface and to return a significant implementation to noise pollution research, currently mostly centred on noise pollution in urban environments.
- **Objective of the research project:** During the period of the contract, the researcher is expected to: • publish at least 3 scientific papers in peer-reviewed scientific journals, or 3 contributes in scientific edited volumes, or 1 monograph; • participate in at least 2 conferences or congresses held by leading scientific associations; • collect eco-acoustic data useful to design and test the web interface; • create sound quality maps of the monitored places and cooperate with the selected company in the production of the open data web interface. The research activities will also include: • collaboration in Department's teaching activities, with lectures, workshops, seminars and support for students, according to the University regulation; • collaboration on Department's organizational activities.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-8 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 10

The specific elements of this procedure are as follows:

- **Department:** Department of Pharmacy and Biotechnology - FaBiT
- **SC:** 01/A2 – GEOMETRY AND ALGEBRA
- **SSD**: MAT/03 – GEOMETRY
- **Number of positions:** 1
- **Thematic area**: Green
- **Thematic area SNSI**: Industria intelligente e sostenibile, energia e ambiente.
- Areas of development of the project SNSI: E-health, diagnostica avanzata, medical devices e mini invasività.
- **PNR topics and articulations**: Ambito 1: SALUTE 1.4 Tecnologie per la salute Articolazione 2. Intelligenza artificiale per la diagnostica di precisione, le terapie personalizzate e per l'innovazione organizzativa e gestionale dei processi sanitari.
- **Main place of employment:** Bologna
- **Contract type:** full-time
- **Project title:** Geometric Deep Learning for a digital and green approach to analysis of biological and medical databases - Thematic area: GREEN.
- **Brief description of the project:** The researcher will collect biological data (eg Chip-Seq Atlas) and will make them homogeneous for the subsequent analysis phase. During this phase we use GNN, CNN and GAN compensate for the missing information. These are relatively new generative techniques that have proved to be extraordinary for image analysis. The research will concern the study of Myc. The researcher will spend a period of at least six months at our partner Nabla2 (Modena) to develop IT strategies for managing the databases
- **Objective of the research project:** The new digital technologies in AI, such as Geometric Deep Learning, allow a new approach to the analysis of biological data, focused on a reduced environmental impact and use of resources in the context of the green transition and digital transition (SNSI, PON Ricerca and Innovation 2014- 2020 (EU) 2020/2221). This analysis will lead to a substantial reduction of time in the laboratory, directing experimental research through machine learning tools and therefore a reduction of special waste, energy saving, conservation of the ecosystem and advanced predictive and personalized diagnostics. As part of the REACT-EU objectives, it will create a high added value in terms of scientific, social and economic repercussions on the national territory, on the issues of green transition, digital transition in collaboration with the partner the company Nabla2, Srl (Modena). Results: 1 Publication / preprint every year in the bio-mathematical field.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 11

The specific elements of this procedure are as follows:

- **Department:** Department of Pharmacy and Biotechnology - FaBiT
- **SC:** 05/I1- GENETICS
- **SSD:** BIO/18 – GENETICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Biotecnologie, bioinformatica e sviluppo farmaceutico.
- **PNR topics and articulations:** Ambito: Salute; Sottoambito: Tecnologie per la Salute; Articolazione: Bioinformatica e Biologia sintetica.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Optimization of genomic analysis algorithms to decrease environmental footprint of highperformance computing - Thematic area: GREEN.
- **Brief description of the project:** Big data approaches allowed biology to reach a new resolution in our understanding of molecular phenomena, from personalized oncology to environmental metagenomics. These approaches require dedicated software and hardware high performance computing resources. It's estimated (source: International Energy Agency) that roughly currently more than 1% (>200TWh) of global energy demands have been spent by data analysis. The candidate will improve data analysis efficiency for genomics datasets under the supervision of Prof. Giorgi, who brings an established expertise in biological algorithms (PMID:27153652, 32232425). Efficiency approaches will include faster programming languages, combinatorial optimization (PMID:27518566), GPU utilization, heuristic and AI approaches to reduce the total number of effective operations. The candidate will execute part of the project in a sequencing company focused on quantitative analysis of -omics data.
- **Objective of the research project:** The proposal is consistent with the goals of green transition, ecosystem conservation and reduction of climate changes, by virtue of proposing solutions to reduce the energy required by high-performance computing clusters, in a rapidly growing field such as computational genomics. We propose to improve the energy-efficiency biological data analysis algorithms, such as transcriptional data quantification, gene network reverse engineering, quantitative trait loci data, using innovational machine learning, linear algebra, and GPU-based approaches. Results will be published in at least two articles on international journals indexed on the SCOPUS or Web of Science databases.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 12

The specific elements of this procedure are as follows:

- **Department:** Department of Pharmacy and Biotechnology - FaBiT
- **SC:** 03/D1 - MEDICINAL, TOXICOLOGICAL AND NUTRITIONAL CHEMISTRY AND APPLIED TECHNOLOGIES
- **SSD:** CHIM/10 - FOOD CHEMISTRY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Salute, Alimentazione, Qualità della vita.
- **Areas of development of the project SNSI:** Nutraceutica, Nutrigenomica e Alimenti Funzionali.
- **PNR topics and articulations:** 6- prodotti alimentari, bioeconomia, risorse naturali, agricoltura, ambiente articolazione 4: Riduzione dei rifiuti (…).
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Circular economy: by-products of the food industry as a source of secondary metabolites in human and animal welfare - Thematic area: GREEN.
- **Brief description of the project:** Among the possible uses of waste from industrial food processing, their use in human and animal health plays an important role. These wastes can be used to extract secondary metabolites with green techniques, study and validate their possible application, in the form of nutraceuticals, in the modulation of targets related to human and animal health. The project will be carried out entirely in collaboration with Bio-Logica Srl. The activities include: 1. identification of food matrices 2. isolation of secondary metabolites trough green techniques 3. validation through in vitro, ex vivo and in vivo models, in the field of human and animal health applications.
- **Objective of the research project:** The transition from a linear economy to a circular economy is highly desirable by stakeholders both to reduce the costs associated with waste disposal and to reduce the environmental impact which, never more than now, is desirable and consistent with PON thematics. This approach allows food waste to be given a second life and reused for various applications. The aim of the project is the selection of food waste from the organic and Italian supply chain, isolation of secondary metabolites through green techniques, identification of the field of application in human and animal health, verification and confirmation, through in vitro studies, ex vivo and in vivo, applications and possible realization of nutraceuticals. This must be combined with the creation of at least two scientific works per year to confirm and support the proposed applications.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** PhD
- **Maximum number of publications:** 20
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 13

The specific elements of this procedure are as follows:

- **Department:** Department of Classical Philology and Italian Studies - FICLIT
- **SC:** 11/A4 - SCIENCE OF BOOKS AND DOCUMENTS, HISTORY OF RELIGIONS
- **SSD**: M-STO/09 – PALEOGRAPHY
- **Number of positions:** 1
- **Thematic area:** Innovation
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici.
- **PNR topics and articulations:** AMBITO Cultura umanistica, creatività, trasformazioni sociali, società dell'inclusione/ 5.2.1 Patrimonio culturale - Articolazione 1. Digitalizzazione dei processi di tutela, conservazione e valorizzazione.
- **Main place of employment:** Bologna
- **Contract type:** Full-time.
- **Project title:** From Shelf to Byte.
- **Brief description of the project:** The researcher will be in charge of transferring inside the Company the specific and technological know-how related to digitalization, metadating and storage of codex and handwritten documents. More specifically the researcher, in tight cooperation with the Company, will: 1) select a core of documents from either books or documents among them stored at the Biblioteca Universitaria of Bologna (BUB) and consistent with the project' scope; 2) digitally acquire the selected sources; 3) design and test innovative systems for analyzing, metadating and long-term storaging of the digital objects; 4) plan and implement innovative systems for handling, adding value to the sources and make them more and easier available.
- **Objective of the research project:** The researcher will report about the project and the achieved results by means of: 1) adequate scientific production (at least 3 articles, 2 of them on magazines in A ranking, also with "publishing in progress" status); 2) publishing related means in bibliography and/or archive matter; 3) "third mission" initiatives like set up of exhibitions (real or virtual), organization and participation to seminars and conferences; 4) high education's courses for internal staff of the Company for transferring the needed technical and scientific competences necessary for creating and innovating the various technological products connected to the field of digitalization, metadating, virtually re-building and long term storaging of book and ancient documents.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 14

The specific elements of this procedure are as follows:

- **Department:** Department of Classical Philology and Italian Studies - FICLIT
- **SC**: 10/D3 - LATIN LANGUAGE AND LITERATURE
- **SSD**: L-FIL-LET/04 - LATIN LANGUAGE AND LITERATURE
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici.
- **PNR topics and articulations:** AMBITO: Cultura umanistica, creatività, trasformazioni sociali, società dell'inclusione/ 5.2.2 Discipline storico, letterarie e artistiche - Articolazione 3. Discipline umanistiche, ambiente e sostenibilità.
- **Main place of employment:** Bologna
- **Contract type:** full-time
- **Project title:** Educational publishing and training for sustainable development and green transition within the field of humanities.
- **Brief description of the project:** To encourage the green transition, it is necessary to promote adequate education for environmental sustainability, with initiatives oriented towards school publishing. The RTD should be able to intervene in the selection of contents, and also identify appropriate methods, promoting the transition to digital, with effective and sustainable tools. Of particular interest in addressing the 'green' theme (also in the light of 'trauma studies') is the analysis of catastrophes (historical or mythical) with particular attention to events caused by the action of man and the loss of a balanced relationship between mankind and nature. The Latin literary documentation on natural catastrophes, and its modern and contemporary reception, can be a tool for focusing on the conflict between the impulse towards exploration and innovation on one hand, and environmental sustainability on the other, prompting a reflection on the ever-precarious balance between technological progress and the environment.
- **Objective of the research project:** The RTD is meant to publish the results of his/her research (both in the form of analysis and exegesis of the text and in the form of broader essays) in series of high scientific level and in scientific journals: among these, at least 3 articles in in A-class journals according to ANVUR rating], with regard to the SSD L-FIL-LET/04. (S)he will attend at least two conferences as a speaker. In addition, the RTD will contribute to the organisation of seminars and/or conferences, and other initiatives in the field of Latin studies.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 15

The specific elements of this procedure are as follows:

- **Department:** Department of Classical Philology and Italian Studies - FICLIT
- **SC:** 10/G1 - HISTORICAL AND GENERAL LINGUISTICS
- **SSD:** L-LIN/01 - HISTORICAL AND GENERAL LINGUISTICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Sistemi e applicazioni per il turismo, la fruizione della cultura e l'attrattività del Made in Italy.
- **PNR topics and articulations:** Cultura umanistica, creatività, trasformazioni sociali, società dell'inclusione/ 5.2.4 Creatività, design e Made in Italy - Articolazione 5. Territori e valorizzazione del Made in Italy.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Ecosystems' and linguistic diversity's protection for tourism enhancement in the dialectal areas of Italy.
- **Brief description of the project:** Given the close correlation between biological diversity and cultural-linguistic diversity, the researcher will be asked to analyze actions that have been carried out in order to maintain both biodiversity and linguistic diversity in 'exotic' regions and to apply these models to the dialect-speaking communities of Italy, proposing linguistic planning strategies and producing materials aimed at their enhancement in terms of sustainable tourism. As is well-known, in Italy the municipalities belonging to a linguistic minority pursuant to law 482/1999 and the regions in which the dialects are still vital are mainly areas where processes of rediscovery in terms of sustainable tourism are underway. A sector in which the RTD, in collaboration with companies interested in the topic, will be able to test strategies for maintaining biodiversity and linguistic diversity is that of agriculture and gastronomy, crucial for strengthening local identities, and for enhancing sustainable tourist flows.
- **Objective of the research project:** The appointee is expected to publish the results of his/her research in at least a monograph and an article in a journal rated 'A' (for 10G1 Academic field) or in at least four articles; two of them must be published in journals rated 'A' (for 10G1 Academic Field). Further aims include the participation as a speaker in conferences on the topics related to the research project. Moreover, the appointee will organize conferences and seminars on the topics of the research project at the University of Bologna.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 16

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
- **Thematic area:** Innovation
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** 5.5.4 Industria intelligente e sostenibile, energia e ambiente - Sistemi produttivi evolutivi e adattativi per la produzione personalizzata.
- **PNR topics and articulations:** 5. CLIMA, ENERGIA, MOBILITÀ SOSTENIBILE; 5.1 Mobilità sostenibile; Articolazione 1. Sistemi di supporto all'analisi e al governo della mobilità.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Cognitive understanding of the new interfaces and innovative and green content (electric vehicles).
- **Brief description of the project:** The project, in response to the needs expressed by the company involved, aims to develop an effective communication system to improve the understanding of the innovative and green content relating to the use of electric vehicles. There are some recognized critical issues, such as range anxiety, which characterize the user of this kind of vehicle. The design of specific interfaces aims to resolve these critical issues, in order to improve the user experience as well as encourage purchases of electric vehicles. The researcher will be involved in the interface design phase as an expert in the cognitive analysis of verbal and non-verbal communicative signals, by implementing user tests of acceptance of interfaces different from those normally used. Some areas of an interdisciplinary nature are involved such as ergonomics, sustainable development and the emotional context related to the decision-making processes.
- **Objective of the research project:** The scientific productivity objectives of the researcher will be aimed, over the three-year period, at the realization of one or more scientific publications in locations (journals and / or volumes) identified as significant with respect to the research area of the project and indexed in international databases (SCOPUS and / or WOS), to the presentation of at least three communications at national or international conferences.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month research period in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 17

The specific elements of this procedure are as follows:

- **Departments**: Department of Philosophy and Communication Studies - FILCOM and Department of Sociology and Business Law - SDE
- **SC:** 14/C2 - SOCIOLOGY OF CULTURE AND COMMUNICATION
- **SSD:** SPS/08 - SOCIOLOGY OF CULTURE AND COMMUNICATION
- **Number of positions:** 2
- **Thematic area:** Green
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: Both researchers will have to carry out a research period of 6 months in a company. The companies will be identified by the Departments.
- **Description of the projects and their specific elements**:
  1) **Project 1** – Department of Philosophy and Communication Studies - FILCOM, **project title**: Coronafood – feeding the city under COVID-19.
  Brief description of the project: This project aims to capture the ways in which cities have worked to address the economic and social impacts caused by Covid-19 in the food system. Feeding cities with their raising populations presents numerous challenges. The pandemic highlighted the scalar interdependency and scarce resilience of global food chains. Where some see obstacles, however, others see opportunities. Retail and alternative food ventures have registered sales explosion during the crisis. By focusing on the cities of Bergamo, Bologna and Trento in Northern Italy, this study aims to investigate challenges and innovative solutions developed in the pandemic, especially in connection with climate change adaptation. The project draws on the perspective of the "sustainable city" and uses mixed methods (ie,social network analysis) to conduct multi-level policy analysis and identify innovative models in support of policy actions to improve local, national and supra-national food systems in the post-Covid-19 Europe.
  Objective of the research project: (a) to identify strengths and weaknesses related to conventional (large-scale) food production and distribution systems during the Covid-19 pandemic; (b) to identify innovative/alternative models that have been developed in particular with the mediation of Information and communications technology (ICT); (c) to assess which models have become competitive within the arena of alternative food systems; (d) to develop governance guidelines to identify and replicate innovative models of "social green innovation" for European urban policies. Scientific articles peer reviewed on Food policy, Geoforum and the Journal of Environmental Policy & Planning. Policy brief: The project will lead to a final policy brief targeted to international stakeholders and policymakers. The brief will be proposed for publication open-access on the IPES-Food website. International conferences: Research outputs will be presented at least at three international conferences: IFAMAC, AESOP, RGS-IBG.
  Number of hours of frontal teaching per year: 60
  Thematic Area SNSI: 5.4.3 Salute, alimentazione, qualità della vita.
  Areas of development of the project SNSI: 5.5.3 Salute, alimentazione, qualità della vita: Traiettorie tecnologiche di sviluppo a priorità nazionale - Sistemi e tecnologie per il packaging, la conservazione e la tracciabilità e sicurezza delle produzioni alimentari.

PNR topics and articulations: 6 - PRODOTTI ALIMENTARI, BIOECONOMIA, RISORSE NATURALI, AGRICOLTURA, AMBIENTE - 6.2 Scienze e Tecnologie alimentari, Articolazione 6. Tendenze emergenti nelle tecnologie alimentari ed efficientamento dei processi di trasformazione.

2) **Project 2**: Department of Sociology and Business Law – SDE, **project title**: Regenerating communication on climate change. Action-research with key players in the field of awareness-raising on ecological transition to promote sustainable lifestyles and create a community of practices.
Brief description of the project: The research activities are aimed at the construction of guidelines for the implementation of awareness-raising interventions on climate change aimed at promoting sustainable behaviours, lifestyles and consumption. The Covid-19 pandemic has made even more evident the need to act in coherence with the objectives of the European Green Deal, rethinking cultural forms and habits that risk condemning future generations. By means of an action-research, this project will investigate citizens' perceptions, map and validate communicative best practices of engagement towards the green transition. In collaboration with a company guidelines and tools to support the ecological and digital literacy of the population will be realised. The networking of the different stakeholders involved will enable the creation of a community of practices capable of promoting the outputs of the research and counteracting inertia towards climate change.
Objective of the research project: Publication of at least one monograph of scientific relevance or publication of 3 articles in a journal of rank A (according to ANVUR classification) for the SSD SPS/08 and an article in a journal or volume of recognized scientific value and participation in Conferences.
Number of hours of frontal teaching per year: 0
Thematic Area SNSI: Agenda Digitale, Smart Communities, sistemi di mobilità intelligente (5.5.6).
Areas of development of the project SNSI: Tecnologie per smart building, efficientamento energetico, sostenibilità ambientale.
PNR topics and articulations: Cultura umanistica, creatività, trasformazioni sociali, società dell'inclusione (5.2) - Articolazione: Trasformazioni sociali e società dell'inclusione (5.2.5).

ATTACHMENT 18

The specific elements of this procedure are as follows:

- **Department:** Department of Physics and Astronomy “Augusto Righi” - DIFA
- **SC**: 02/B1 - EXPERIMENTAL PHYSICS OF MATTER
- **SSD**: FIS/03 – PHYSICS OF MATTER
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Materiali innovativi ed ecocompatibili/Tecnologie per le smart grid, le fonti rinnovabili e la generazione distribuita.
- **PNR topics and articulations:** Ambito: CLIMA, ENERGIA, MOBILITÀ SOSTENIBILE - Articolazione: Articolazione 4. Reti e veicoli green e- clean; AMBITO: Energetica industriale - Articolazione Generazione di energia da FER (Fonti di Energia Rinnovabile), accumuli energetici e reti europee e intercontinentali.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Non-toxic and innovative thin film solar cells based on hybrid perovskites
- **Brief description of the project:** The actual climate crisis requires a rapid transition toward a zero-carbon emission economy. One of the most important and promising technology that can significantly contribute to this transition is photovoltaics (PV), nowadays Si solar cells are capable to provide low cost and long lifetime (>30 years) electric energy. Besides Si, Pb-halide perovskites (pvk) are very important newcomers in the field of solar energy, because of its deposition temperature lower than the Si one (80° vs 1400°C) and efficiency comparable with that of Si cells. However, several concerns remain about stability and toxicity of these lead-based compounds. The development of Pb-free pvk solar cells is a stimulating research field with a lot of potential, both in terms of fundamental physics and device engineering. The scientist will develop stable lead-free pvk cells through optimization of growth methods, study of defect and interface electronic properties, defect passivation procedures and device processing.
- **Objective of the research project:** The scientist in charge of the project will be able to contribute to publications in the field of advanced materials and renewable energy (photovoltaics), present the project results to conferences, collaborate with the company involved in the proposal for patent applications. Quantitative targets: from 2 to 3 publications per year in high impact research journals (nanoenergy, ACS energy, Solar Energy Materials and solar Cells, Renewable & Sustainable Energy Reviews, Advanced Materials, Nature Energy) from 1 to 2 International Conference Presentations per year 1 per year: contribution to writing research proposal at EU and national level in the field of renewable energy, involving companies and partner Universities 1/2 PhD student supervision and co-supervision.
- **Number of hours of frontal teaching per year:** 40
- **Admission requirement** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A research period abroad of 6 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 19

The specific elements of this procedure are as follows:

- **Department:** Department of Physics and Astronomy “Augusto Righi” - DIFA
- **SC:** 02/C1 - ASTRONOMY, ASTROPHYSICS, EARTH AND PLANETARY PHYSICS
- **SSD:** FIS/06 – PHYSICS OF THE EARTH AND OF THE CIRCUMTERRESTRIAL MEDIUM
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Agenda Digitale, Smart Communities, Sistemi di mobilità intelligente.
- **PNR topics and articulations:** Clima, energia, mobilità sostenibile.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Nature-based solutions to mitigate the effect of climate change in urban areas.
- **Brief description of the project:** The research activity of the candidate will be to evaluate the upscaling and replication potential of NBS both in the temporal and spatial dimension, using state-of-the-art models, climate change projections and cutting-edge techniques for multiscale monitoring. The research activity will be articulated into three phases: monitoring, numerical modeling and evaluation. Specifically, it will contribute to the monitoring of NBS on a local scale; will use multi-scale modeling chains for risk mitigation assessment in climate scenarios; will develop feasibility methods of NBS solutions.
- **Objective of the research project:** The productive purposes are to write scientific papers in high impact journals (at least 2 per year) and to contribute to the research activities related to the role of NBS on climate and climate change already ongoing within the atmospheric physics group.
- **Number of hours of frontal teaching per year:** 40
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: English language.
- **Research period in a company/abroad:** A research period of 6 months at a foreign company is scheduled, the company will be identified by the Department.

ATTACHMENT 20

The specific elements of this procedure are as follows:

- **Department:** Department of Physics and Astronomy “Augusto Righi” - DIFA
- **SC**: 02/D1 - APPLIED PHYSICS, PHYSICS TEACHING AND HISTORY OF PHYSICS
- **SSD**: FIS/07 – APPLIED PHYSICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI**: Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI**: Sviluppo dell’agricoltura di precisione e l’agricoltura del futuro.
- **PNR topics and articulations**: 5.6. Prodotti Alimentari, Bioeconomia, Risorse Naturali, Agricoltura, Ambiente - 5.6.4 Conoscenza e gestione sostenibile dei sistemi agricoli e forestali - Articolazione 4. Attività agricola e forestale a protezione dell’ambiente e delle risorse naturali.
- **Main place of employment:** Ravenna
- **Contract type:** Full-time
- **Project title:** Software Decision Support System (DSS) for soil carbon sequestration in precision and future agriculture, aimed at curbing climate change and help reach carbon neutrality.
- **Brief description of the project:** The aim of this project is to include biochar and other carbon sequestration agricultural techniques in a DSS for the agricultural sector, in order to help farmers, cooperatives and public officers in evaluating different strategies to reduce their CO2 emissions to the atmosphere, and to calculate their carbon credits. To do so, the first step would be to select the most suitable carbon dynamic model (based on throughout literature research), and later its adaptation to local climatic-soil conditions (with a special focus on Mediterranean climate). Then, biochar dynamics need to be included into the model, and the inclusion validated against various long-term experiment datasets of biochar in soils, coming from across the EU. Finally, the resulting model needs to be simplified and adapted to be included in a DSS already used and renown in the agricultural market (e.g. Agrigenius, Blueleaf, smart-irrigation systems, etc). From TRL 4(based on current collaboration with the company Hort@)to TRL 7.
- **Objective of the research project:** The objective is to publish at least three scientific articles, one for each year of the research project, and to present the scientific results at international conferences (e.g. the European Geoscience Union meeting) and contributions to international initiatives such as the Global Land Project and initiatives under the EU's Caring for Soil Mission. The three articles would be tied to the main research actions mentioned above, and would have, as provisional titles: • Adaptation (or validation) of a Soil Carbon Dynamic model to dry conditions in the Mediterranean area; • Inclusion of biochar dynamics in a Soil Carbon Dynamic model, and its validation using a Europeanwide dataset • Field validation of the biochar model, and its forecasts.
- **Number of hours of frontal teaching per year:** 30
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A research period abroad of 12 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 21

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:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Digital Agenda, Smart Communities.
- **Areas of development of the project SNSI:** Smart sensor networks, internet of things.
- **PNR topics and articulations:** Areas: "Digital transition"; "Artificial intelligence" - Trajectories: "Networks of Intelligent Systems"; "Sustainable Communities"; "Artificial intelligence for the environment".
- **Main place of employment:** Cesena
- **Contract type:** Full-time
- **Project title:** Techniques & strategies for Green Autonomic Internet of Things (GA-IoT).
- **Brief description of the project:** The activity will concern one or more topics of strategic importance for DISI: Software engineering, Distributed and mobile systems, Artificial intelligence, Programming languages. The researcher will apply and extend innovative methodologies and technologies of Autonomic Computing (and self- * systems) to develop principles, models, and technologies for solving relevant problems in the field of engineering of Green IoT systems, in particular related to systems and services provided by a multitude of intelligent devices interacting in dynamic environments. This activity will be conducted in collaboration with one or more research groups established within DISI for that research area, scientific collaborations will be developed with national and international research groups, and it will be possible for the researcher to be involved in the preparation of funding requests at national or international level.
- **Objective of the research project:** The scientific productivity expected for the three-year period is at least six articles in internationally relevant venues (journals and conference proceedings), of which at least two in international journals.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of 6-12 months in a company is foreseen, the company will be identified by the Department.

ATTACHMENT 22

The specific elements of this procedure are as follows:

- **Department**: Department of Civil, Chemical, Environmental, and Materials Engineering - DICAM
- **SC**: 09/D1 - MATERIALS SCIENCE AND TECHNOLOGY
- **SSD:** ING-IND/22 - MATERIALS SCIENCE AND TECHNOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Materiali innovativi ed ecocompatibili - Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Digitale Industria Aerospazio - Relative aree di intervento: Innovazione per l'industria manifatturiera. Articolazione 1. Industria circolare, pulita ed efficiente.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Product and process sustainability for the production of tiles.
- **Brief description of the project:** The scientific activity will be addressed on the typical topics of the field Materials Science and Technology, with a specific focus on ceramic materials and geopolymers in terms of sustainability. The project will focus on: development of novel ceramic and/or geopolymer tiles with low temperature processes in order to reduce CO2 emissions development of novel ceramic and/or geopolymer products with high content of recycled raw materials Process optimisation of the products previously developed with innovative technologies (e.g. additive manufacturing) The project will be focused on the use of recycled and local raw materials for low temperature sintering and room temperature geopolymerization. Expected results are tiles prototypes and optimised process procedures for the developed products.
- **Objective of the research project**: The scientific goals to reach are as follows: at least 3 papers published on peer review international journals (including one in an open access international journal) and 3 contributes published on national and/or international proceedings.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of research of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 23

The specific elements of this procedure are as follows:

- **Department**: Department of Civil, Chemical, Environmental, and Materials Engineering - DICAM
- **SC**: 09/D3 - CHEMICAL PLANTS AND TECHNOLOGIES
- **SSD:** ING-IND/25 - CHEMICAL PLANTS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente; Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** - Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale; - Sistemi per la sicurezza dell'ambiente urbano, il monitoraggio ambientale e la prevenzione di eventi critici o di rischio.
- **PNR topics and articulations:** Clima, energia, mobilità sostenibile / sicurezza per i sistemi sociali - Relative aree di intervento: Mobilità sostenibile. Articolazione 4. Reti e veicoli green e clean; Sicurezza delle strutture, infrastrutture e reti. Articolazione 1. Analisi e valutazione dei rischi e della resilienza.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Development of hydrogen-based carbon-neutral technologies in the framework of energy transition.
- **Brief description of the project:** The aim of the project is the development of enabling technologies for an energy supply chain based on cryogenic hydrogen (LH2). The activity will be divided in two main tasks: i) the analysis of the cryogenic storage system; ii) the development of a specific technology for LH2 vaporization to feed the final users of the LH2 supply chain. The first task will address the analysis of alternative technologies for the storage of LH2 and the assessment and modelling of accident scenarios. The second task will be aimed at the modelling of physical and chemical phenomena, addressing the kinetic modelling of LH2 vaporization. Part of the activity (6 to 12 month) will be carried out in a company.
- **Objective of the research project**: Over the 3-years period of the contract, the publication of at least 5 papers in peer reviewed scientific journals presenting the results obtained in the project, and the participation in at least to 3 international scientific conferences will be required.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 24

The specific elements of this procedure are as follows:

- **Department**: Department of Civil, Chemical, Environmental, and Materials Engineering - DICAM
- **SC**: 08/A3 - INFRASTRUCTURAL AND TRANSPORTATION ENGINEERING, REAL ESTATE APPRAISAL AND INVESTMENT VALUATION
- **SSD:** ICAR/04 - ROADS, RAILWAYS AND AIRPORTS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Materiali innovativi ed ecocompatibili.
- **PNR topics and articulations:** Clima, energia e mobilità sostenibile - Relative aree di intervento: Mobilità sostenibile - Articolazione 2 “Infrastrutture per la mobilità accessibili, ecocompatibili, intelligenti e sicure, resilienti, efficienti”.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Low environmental impact urban pavements.
- **Brief description of the project:** The final aim of the research project is the development of innovative solutions for the construction of "green" urban pavements, which are able to meet the environmental needs of the cities of the future. Different solutions will be studied to control of pavements run-off, together with systems able to promote their bio-remediation. Sustainable and recycled materials will be studied for the creation of paved surfaces capable of reducing the Urban Heat Island effect. The project consists of an initial screening activity on the background and on the state-of-the-art on the environmental issues in urban areas related to pavements. Then the study of the innovative systems and materials will be developed, through laboratory and in situ research. The proposed solutions and application will be validated through specific trial fields and Life Cycle Assessment analysis.
- **Objective of the research project**: The researcher must publish, over the duration of the contract, an adequate number (at least 5) of scientific publications in the most relevant journals of the sector or related sectors, in the case of multidisciplinary research. The researcher must also attend national and international conferences, symposia, workshops and seminars to disseminate, discuss, compare and verify the outcomes carried out during the research activity.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month research period in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 25

The specific elements of this procedure are as follows:

- **Department:** Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
- **SC:** 09/E1 - ELECTRICAL ENGINEEERING
- **SSD:** ING-IND/31 – ELECTRICAL ENGINEERING
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale; Tecnologie per le smart grid, le fonti rinnovabili e la generazione distribuita.
- **PNR topics and articulations:** - Ambito: Digitale, Industria, Aerospazio. Innovazione per l'industria manifatturiera. Articolazione 1. Industria circolare, pulita ed efficiente; - Ambito: Clima, Energia, Mobilità sostenibile Energetica industriale; Articolazione 3. Decarbonizzazione dell'industria: produzione locale da FER, uso efficiente e sostenibile dell'energia e dei materiali, trasformazione dei vettori energetici.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Energy saving, efficiency improvement and green energy transition of mechatronic industrial processes.
- **Brief description of the project:** The aim of the project is the energy/electrical efficiency improvement in industrial production chain for the mechatronics sector. In particular, the project focuses on efficiency, optimization, and energy yield of mechatronic components and systems, up to the study of the "green" transition of the energy supply of entire industrial process. In addition, technologies for reducing energy requirements for cooling and heating the production environment through the use of renewable sources will be investigated. Issues related to energy storage will also have to consider the possibility of using hydrogen (electrolysers / fuel cells). During the project, a total period of at least 6 months (maximum 12 months) will be carried out in cooperation with at least 3 companies. The companies should be preferably partners of the "Formazione Universitaria a orientamento Professionale (FUP)" foundation.
- **Objective of the research project:** Drafting and finalizing at least 3 energy requalification projects developed during the three-year period with 3 partner companies and publishing the results in national or international workshops, conferences, or journals.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department**.**

ATTACHMENT 26

The specific elements of this procedure are as follows:

- **Department:** Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
- **SC:** 09/F2 - TELECOMMUNICATIONS
- **SSD:** ING-INF/03 – TELECOMMUNICATIONS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Sistemi elettronici “embedded”, reti di sensori intelligenti, internet of things. Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Ambito: Digitale, Industria, Aerospazio. -- Transizione digitale - i4.0: Articolazione 4. Dispositivi e sistemi eterogenei Articolazione 5. Reti di sistemi intelligenti -- Innovazione per l’industria manifatturiera Articolazione 3. Industria intelligente.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Wireless Systems for the transition towards energy efficient and sustainable industrial processes.
- **Brief description of the project:** Design and performance analysis of radio systems for applications related to Industry 4.0, with particular attention to the development of energy efficient solutions and sustainable industry processes. These solutions will allow to monitor the state of industrial machines in a more efficient way than current solutions, in order to limit waste in terms of materials and energy consumption. Through the timely monitoring of the state of the machine parts it will be possible to identify and predict any malfunctions and problems related to the wear of the pieces, as well as the elimination of cables for communication between the sensors and the machine controller. It will allow to reduce installation costs and times, as well as consumption, thanks to the use of energy harvesting techniques. The activities will include both basic theoretical and experimental research, with the aim of developing a PoC to be tested in some companies of the Technical Committee of Mechatronics (e.g,, IMA or GD).
- **Objective of the research project:** One journal paper per year, published on international journals of Class A and one paper per year presented at an International Conference, subject to peer review.
- **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**: English Language
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department**.**

ATTACHMENT 27

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
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Area: Digitale, Industria, Aerospazio; Ambito: Innovazione per l'industria manifatturiera; Articolazioni: - Industria circolare, pulita ed efficiente - Industria intelligente.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Design of mechatronic systems and control-automation platforms for the transition to sustainable and intelligent industry.
- **Brief description of the project:** The activity is linked to Italian SNSI Innovative and high-efficiency production processes for industrial sustainability, and PNR Innovation for manufacturing industry, Sub: Circular, clean and efficient industry – Intelligent Industry. Transition to a "true green" industry requires innovative technologies, leading to unprecedented complexity which asks for advanced automation and control solutions. Therefore, methodological and application-oriented research will be carried out to reduce energy and material usage in production processes. A multidisciplinary and conscious approach to "real world" industrial practice will be crucial to combine innovative mechatronic and ICT technologies with advanced control methods. A total period of 6 months is expected to be spent in three companies, at most, of the industrial automation domain to realize smart and green systems, preferably in collaboration with the "Fondazione Formazione Universitaria a orientamento Professionale" (FUP).
- **Objective of the research project:** The selected candidate is expected to publish at least four papers in international journals or conferences. These papers should be related to the development of mechatronic systems and/or control applications oriented to optimization of production plants and minimization of energy and material usage.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month research period in a company is scheduled, the company will be identified by the Department**.**

ATTACHMENT 28

The specific elements of this procedure are as follows:

- **Department:** Department of Industrial Engineering - DIN
- **SC**: 09/C2 - THERMAL SCIENCES, ENERGY TECHNOLOGY, BUILDING PHYSICS AND NUCLEAR ENGINEERINGù
- **SSD**: ING-IND/10 - THERMAL ENGINEERING AND INDUSTRIAL ENERGY SYSTEMS
- **Number of positions:** 1
- **Thematic area:** Green
- **SNSI thematic area and areas of development**: Tecnologie per smart building, efficientamento energetico, sostenibilità ambientale.
- **PNR topics and articulations:** CLIMA, ENERGIA, MOBILITÀ SOSTENIBILE: Energetica industriale e Energetica ambientale.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Evaluation of seasonal energy performance indicators of electric Multi-source Heat Pump with a “Hardware-in-the-Loop” test rig.
- **Brief description of the project:** The focus of this project is on the optimization of the seasonal performance of both traditional (air or geothermal) and multi-source electric heat pumps through the definition of innovative control strategies. The researcher will also conduct the study using a period abroad at European centers active in the definition of new protocols for dynamic tests on heat pumps. The goal is to be able to obtain a better exploitation of renewable aerothermal, solar and geothermal energy in the conditioning of buildings that enhances energy efficiency and the de-carbonisation of the building stock by accelerating the transition from boilers to electric heat pumps in HVAC systems. This project is in agreement with the topics indicated by point b) (Green topic) of art. 2 of D.M. 1062 10/08/2021.
- **Objective of the research project**: 1. Definition of new protocols for concise laboratory tests about the evaluation of the seasonal energy performance of electric heat pumps coupled to a specific building. 2. Upgrade and optimization of the experimental apparatus for Hardware-in-the-Loop tests on both conventional and multi-source heat pumps at the “Fisica Tecnica” Laboratory of DIN 3. Participation and oral presentations of the results achieved at, at least, 5 National and International Conferences during the three years period on the subject of energy saving, energy efficiency and use of renewable sources in HVAC systems 4. Publication of at least 6 scientific papers in international journals dedicated to energy efficiency, use of renewable sources, environmental impact of HVAC systems. 5. Development of international collaborations on the topic of boiler-heat pump transition in buildings and new concise protocols for experimental tests on the energy performance of electric heat pumps.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A research period abroad of 6 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 29

The specific elements of this procedure are as follows:

- **Department:** Department of Industrial Engineering - DIN
- **SC:** 09/A2 - APPLIED MECHANICS
- **SSD:** ING-IND/13 - APPLIED MECHANICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente; Salute, alimentazione, qualità della vita**;** Agenda Digitale, Smart Communities, Sistemi di mobilità intelligente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale; Sistemi produttivi evolutivi e adattativi per la produzione personalizzata; Sistemi e tecnologie per le bonifiche di siti contaminati e il decommissioning degli impianti nucleari; Sviluppo dell'agricoltura di precisione e l'agricoltura del futuro; Tecnologie per smart building, efficientamento energetico, sostenibilità ambientale.
- **PNR topics and articulations:** Ambito 1 di progetto (5.4.4 di PNR) DIGITALE, INDUSTRIA, AEROSPAZIO: Robotica -- Articolazione 1.1 di progetto (articolazione 1 di 5.4.4): Robotica in ambienti ostili e non strutturati o Articolazione 1.2 di progetto (articolazione 2 di 5.4.4): Robotica per industria 4.0 - Articolazione 1.3 di progetto (articolazione 3 di 5.4.4): Robotica per l'ispezione e la manutenzione di infrastrutture; - Articolazione 1.4 di progetto (articolazione 4 di 5.4.4): Robotica per il settore agroalimentare.· Ambito 2 di progetto (5.4.6 di PNR) DIGITALE, INDUSTRIA, AEROSPAZIO: Innovazione per l'industria manifatturiera" - Articolazione 2.1 di progetto (articolazione 1 di 5.4.6): Industria circolare, pulita ed efficiente; - Articolazione 2.2 di progetto (articolazione 2 di 5.4.6): Industria inclusiva: - Articolazione 2.3 di progetto (articolazione 3 di 5.4.6): Industria intelligente.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Highly-efficient and human-safe robotic systems for large-scale manipulation of large payloads.
- **Brief description of the project:** This project will study innovative robotic systems devoted to large-scale manipulation of heavy loads. Such robots will be applicable to poorly-automated operations, not optimized for resource consumption, and possibly unsafe for human workers. The development of this class of manipulators aims to robotize agricultural tasks, maintain solar and wind farms, increase lifting operation efficiency (both on the ground and at sea), and realize the additive manufacturing of buildings. The final goal of this study is to improve both the efficiency (in terms of physical and energy resources) and workers' safety and comfort, in the fields where these robots are supposed to be used, in order to achieve total sustainability (environmental, economic, and social), thus taking into account not only productivity, but also ecological impact and workplace quality (PNR intervention areas: 5.4.4, items 1,2,3,4; 5.4.6,items 1,2,3).
- **Objective of the research project:** 1) At least 4 scientific articles published in SCOPUS-indexed international journal, and at least 6 papers presented at international conferences whose proceedings are indexed by SCOPUS. 2) Development of small-scale prototypes of the studied robotic systems for the experimental assessment of their performances (in laboratory conditions).
- **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 with verification of the adequate knowledge of the English language.

- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 30

The specific elements of this procedure are as follows:

- **Department:** Department of Industrial Engineering - DIN
- **SC**: 09/A3 - INDUSTRIAL DESIGN, MACHINE CONSTRUCTION AND METALLURGY
- **SSD**: ING-IND/15 - DESIGN METHODS FOR INDUSTRIAL ENGINEERING
- **Number of positions:** 1
- **Thematic area:** Green
- **SNSI thematic area and areas of development**: Health, nutrition, quality of life.
- **PNR topics and articulations:** E-health, advanced diagnostics, medical devices, and mini-invasiveness.
- **Main place of employment:** Bologna
- **Commitment:** Full-time
- **Project title:** Development and characterization of bio-compatible plastic materials for biomedical applications and suitable for 3D printing.
- **Brief description of the project:** The research activity will be focused on eco-friendly and bio-compatible plastic materials for advanced diagnostic strategies, planning of surgical operations and the creation of models and devices to simplify medical-surgical treatments, obtained with low-impact processes on health and the environment. In collaboration with leading hospitals in the orthopedic, physiatric and cardiac surgery fields, advanced diagnostic techniques and strategic planning of surgical interventions will be developed, through the use of biocompatible materials with low environmental impact, also through processes that know how to limit waste and reduce time and costs. Mechanical and thermal characterizations of biocompatible and eco-sustainable materials used for biomedical purposes will be carried out using 3D printing processes, with the aim of optimizing static, fatigue and dynamic behavior.
- **Objective of the research project:** The scientific productivity objectives in the 3-year period will be the following: (a) at least 3 presentations as speaker at renowned national/international conferences dealing with the SSD ING-IND/15 (Design and Methods) topics; (b) at least 5 publications in peer-reviewed, Scopus/WOS-indexed scientific journals, coherent with the SSD INGIND/15 (Design and Methods) topics.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 31

The specific elements of this procedure are as follows:

- **Departments:** Department of Interpreting and Translation - DIT and Department of Modern Languages, Literatures, and Cultures - LILEC
- **SC:** 10/H1 - FRENCH LANGUAGE, LITERATURE AND CULTURE
- **SSD**: L-LIN/04 - LANGUAGE AND TRANSLATION – FRENCH
- **Number of positions:** 2
- **Thematic area:** Innovation
- **Contract-type:** Full-time
- **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 with verification of the adequate knowledge of the French language.
- **Research period in a company**: Both researchers will have to carry out a research period of 6-12 months in a company. The companies will be identified by the Departments.
- **Description of the projects and their specific elements:**
  1) **Project 1** - Department of Interpreting and Translation - DIT, **project title**: Linguistic innovation in the field of translation technology in the corporate environment as a competitive advantage and a growth acceleration factor.
     Brief description of the project: The project will focus on: 1) selection of firms (focus group). This action is aimed at a systematic survey of existing practices and activities as well as areas of intervention in businesses in terms of technology for translation and terminology using CAT Tools and automatic translation. 2) Identification of the expertise gained by the Department of Interpretation and Translation (DIT) and verification of the conditions of transfer into business world of the linguistic and technological products of the DIT. 3) A feasibility study and guidelines for the creation of tailored technological tools that will allow firms to optimize their linguistic and terminological products and to operate autonomously: 1) scalable terminological databases in the languages and sectors of the areas of business under examination; 2) designing of adaptive automatic translation tools.
     Objective of the research project: Over the course of the three-year contract the researcher will produce at least two publications of which at least 1 journal article.
     Main place of employment: Forlì
     Thematic Area SNSI: Industria intelligente e sostenibile, energia e ambiente. **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
     PNR topics and articulations: 5.4.1 Transizione digitale. Articolazione 3. Competitività del paese.
     Research period abroad: A research period abroad of 6-12 months is scheduled, the host foreign structure will be identified by the Department.
  2) **Project 2** - Department of Modern Languages, Literatures, and Cultures - LILEC, **project title**: Computational linguistics and computational ontology, culture and ecological transition: semantic modeling to inform the definition of policies addressing circular economy, landscape conservation and the fight against global warming.
     Brief description of the project: The researcher will develop multidisciplinary research by combining natural language processing, semantic modeling, knowledge extraction, and critical discourse analysis applied to cultural and environmental heritage. The main focus will be on computational methods for discourse analysis to automate the

construction of ontologies and knowledge graphs from texts (production and reception) disseminated by official organizations, media and social media. In this sense, a better understanding of the environmental heritage provides a key element to inform the definition of policies addressing sustainability and the green transition through circular economy (functional reuse of heritage), landscape conservation, and heritage protection actions to counteract global warming. The intercultural and multilingual perspective between Italian and French will be a specific research subject.

Objective of the research project: The objectives of this research can be summarized as follows: 1) To develop innovative technologies and methods to preserve and transmit cultural contents and produce new ones. 2) To increase knowledge about, the ability to interpret, enhance, reuse and preserve cultural and environmental heritage, in an open science and green perspective, supporting actions for the protection and free access to data. 3) To deepen the concept of heritage as an inspiring tool for creativity and innovation to address key issues such as climate change and biodiversity. 4) To inform the definition of policies to support circular economy.

Main place of employment: Bologna

Thematic Area SNSI: Turismo, Patrimonio culturale e industria della creatività.

Areas of development of the project SNSI: Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici

PNR topics and articulations: Ambiti: 5.2. CULTURA UMANISTICA, CREATIVITÀ, TRASFORMAZIONI SOCIALI, SOCIETÀ DELL'INCLUSIONE - 5.2.1 Patrimonio culturale - Articolazione 5. Approccio partecipativo al patrimonio culturale.

ATTACHMENT 32

The specific elements of this procedure are as follows:

- **Department:** Department of Modern Languages, Literatures, and Cultures - LILEC
- **SC:** 10/L1 - ENGLISH AND ANGLO-AMERICAN LANGUAGES, LITERATURES AND CULTURES
- **SSD:** L-LIN/12 - LANGUAGE AND TRANSLATION – ENGLISH
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Riduzione dell'impatto ambientale (green engine).
- **PNR topics and articulations:** 5.2. CULTURA UMANISTICA, CREATIVITÀ, TRASFORMAZIONI SOCIALI, SOCIETÀ DELL'INCLUSIONE - 5.2.2 Discipline storico, letterarie e artistiche - Articolazione 3. Discipline umanistiche, ambiente e sostenibilità.
- **Main place of employment:** Bologna
- **Contract type:** full-time
- **Project title:** Developing a Discursive Ecosystem for the Promotion of Sustainable Tourism.
- **Brief description of the project:** In line with the United Nations World Tourism Organization's objective to implement a "green" transition in the tourism sector (see https://www.unwto.org/tourism4development2017), the activity of the RTDa is centered around the development of discursive practices and innovative communication technologies for the promotion of cultural and environmental heritage tourism, with the aim of advancing local sustainable tourism for the international market. In particular, this activity involves two components: the first focuses on the study and development of communicative strategies and multimodal promotional material for the web, the second is centered on questions of translation in the field of sustainable tourism. The translation practice component is informed and augmented by the compilation of tailored corpora and lexical data.
- **Objective of the research project:** The planned research activity is comprised of the following: 1) Development of tailored multimodal and digital templates in English for the promotion of cultural and environmentally sustainable tourism; 2) Development of Target-Oriented translations from Italian into English of promotional material for sustainable tourism; 3) Development of open access lexical banks and specialized corpora of cultural and environmental tourism.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 33

The specific elements of this procedure are as follows:

- **Department:** Department of Mathematics - MAT
- **SC:** 01/A3 - MATHEMATICAL ANALYSIS, PROBABILITY AND STATISTICS
- **SSD:** MAT/06 - PROBABILITY AND STATISTICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Tecnologie per le smart grid, le fonti rinnovabili e la generazione distribuita.
- **PNR topics and articulations:** Ambito CLIMA, ENERGIA, MOBILITÀ SOSTENIBILE: 5.5.4 Energetica ambientale. Articolazione 2: Edifici, storage, e interazione con energy communities e smart energy grid; - 5.5.3 Energetica industriale. Articolazione 1: Reti intelligenti, flessibili, integrate, resilienti e digitalizzate per una piena integrazione delle FER.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Stochastic optimization techniques for renewable production.
- **Brief description of the project:** The research project aims at developing forecasting techniques for renewable production and power demand, as well as to implement stochastic optimization techniques that allow energy producers to design an optimal power generation mix. Forecasting techniques can be obtained by means of neural networks modeling production or demand in terms of relevant variables such as prices, volumes, climate conditions. Stochastic optimization can be formulated in terms of stochastic optimal control problems with mid-term finite horizon, modeling the underlying dynamics via diffusion processes with mean field interactions. The development of stochastic optimization techniques, which combine innovative probabilistic forecast and advanced tools of stochastic analysis, represents no doubt a key challenge for energy producers to manage the transition from fossil to renewable energy sources.
- **Objective of the research project:** The task of scientific productivity of the researcher will be aimed at: the production of scientific papers on high quality and peer-reviewed journals of international level, with a good or excellent evaluation according to the criteria of the University, the participation to conferences and seminars for the dissemination of the results, and the submission of research projects related to the "green transition", the direct collaboration with the research division of a well-established energy provider, dedicated to addressing crucial challenges such as decarbonation and climate change impact, the development of novel mathematical and statistical techniques to risk assessment and price modeling, employing both classical methods and cutting-edge techniques, including machine learning algorithms and advanced tools of stochastic analysis.
- **Number of hours of frontal teaching per year:** 48
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** English language
- **Research period in a company**: A period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 34

The specific elements of this procedure are as follows:

- **Department:** Department of Mathematics - MAT
- **SC:** 01/A4 - MATHEMATICAL PHYSICS
- **SSD:** MAT/07 - MATHEMATICAL PHYSICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area and Areas of development project SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **PNR topics and articulations:** 4.3 Intelligenza Artificiale.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** A mathematical-physics approach to improve energy efficiency in classical and quantum machine learning.
- **Brief description of the project:** The 2019 report of McKinsey on AI estimates that by 2030 the energy consumption of machine learning technology will exceed half of the total energy available. Such unsustainable scenario makes it urgent a thorough revision of the technological methods. This can be done only through a deep understanding of the mechanisms at the basis of learning in neural networks. Just to mention some specific issues: is it possible to reduce the size of those machines, eliminate their redundancy, and cut their energy consumption? The answer requires a paramount detailed knowledge on the principles those machines work on, nowadays still largely lacking. The statistical mechanics approach to the Boltzmann Machines, a mathematical-physics representation of neural networks, represents one of the major and most promising paths toward their clarification. Reducing the computational complexity of machine learning is of high interest for the companies working in high precision and high-performance mechanics.
- **Objective of the research project:** The purpose is to obtain some optimal efficiency criterium with methods of statistical mechanics of both equilibrium and non-equilibrium type involving possibly quantum computation techniques that are well known efficient tools on Artificial Intelligence studies. In particular the analysis of some case studies from real and synthetic dataset will be implemented to test the efficiency suggested by general theoretical results. The results are expected to be published in international reviewed journals.
- **Number of hours of frontal teaching per year:** 48
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** English language
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 35

The specific elements of this procedure are as follows:

- **Department:** Department of Mathematics - MAT
- **SC:** 01/A6 - OPERATIONS RESEARCH
- **SSD:** MAT/09 - OPERATIONS RESEARCH
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Agenda Digitale, Smart Communities, Sistemi di mobilità intelligente.
- **Areas of development of the project SNSI:** Sistemi di mobilità urbana intelligente per la logistica e le persone.
- **PNR topics and articulations:** Ambito "CLIMA, ENERGIA, MOBILITÀ SOSTENIBILE": Mobilità sostenibile; Articolazione 3. Servizi di mobilità e trasporto (la ricerca comunque avrà sovrapposizioni con le altre articolazioni, in particolare l'articolazione 1 e 5).
- **Main place of employment:** Cesena
- **Contract type:** Full-time
- **Project title:** Models, methods, and algorithms for sustainable mobility.
- **Brief description of the project:** Today, one of the main environmental, social, and business challenges is defining a new sustainable mobility of people and goods. The transition of traditional transport systems to new technologies and new processes requires the solution of several problems ranging from the definition of the recharging networks to the routing of self-driving vehicles in fully decentralized systems. The research aims to define some basic optimization problems and for some of them to propose new models and solution methods. The research will consider both new problems and problems already under investigation by the scientific community, but still without satisfactory solutions. The most interesting problems concern the effective and efficient use of traditional, electric, and self-driving vehicles, including their use for passenger and freight services, e.g., to reduce costs, travel times, pollution, and traffic congestion.
- **Objective of the research project:** The main research objectives are the development of new models, methods, and algorithms for the following strongly correlated problems: origin-destination traffic flow estimation combining data from multiple source, optimal placement of recharging stations, optimal recharge scheduling for electric vehicles used for passenger and freight services, dynamic routing for self-driving vehicles by a centralized system, dynamic routing for self-driving vehicles by a fully decentralized system. The solution of these problems will allow the development of systems to support private transports and passenger and freight services. Our research will focus on the development of exact and heuristic methods based on mathematical programming. The results of this research will be published on scientific journals.
- **Number of hours of frontal teaching per year:** 48
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** English language
- **Research period in a company**: A period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 36

The specific elements of this procedure are as follows:

- **Department:** Department of Experimental, Diagnostic and Specialty Medicine - DIMES
- **SC:** 06/D3 - BLOOD DISEASES, ONCOLOGY AND RHEUMATOLOGY
- **SSD**: MED/06 - MEDICAL ONCOLOGY
- **Number of positions:** 1
- **Thematic area:** Innovation
- **SNSI thematic area and areas of development:** - E-health, diagnostica avanzata, medical devices e mini invasività; - Medicina rigenerativa, predittiva e personalizzata.
- **PNR topics and articulations: -** Implementazione dei sistemi di diagnosi, terapia e follow-up per le malattie non- trasmissibili e/o legate all'invecchiamento; - Sostenibilità sistemica di prodotti, processi, servizi.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Medical assistance services:** The researcher will perform medical care services at the hospital facility of Ospedale Sant'Orsola - UOC Oncologia (Prof. Ardizzoni).
- **Project title:** Multilevel technology approach in cancer patient's treatment: integrating genomic, epigenomic and gene expression data.
- **Brief description of the project:** Set up of "tumor molecular board" at the University of Bologna and l'IRCCS AOU di Bologna involving experts in different disciplines in order to develop collaborations and shared knowledge; Development of a data-base of rare molecular alterations associated with most common cancers and those associated with rare forms of cancer; Promoting and conducting translational research studies aimed at identifying new molecular markers trough a multilevel technology approach; Correlating identified molecular markers with clinical outcome in cancer patients; Promoting and conducting early national and international clinical studies assessing efficacy of new drugs and novel treatment strategies; Managing patients enrolled into clinical studies on new drugs and/or arre tumors or tumors with rare molecular alterations; Promoting the importance of advanced technology in precision oncology through scientific comunications, media talks, university, guideline development and conferences.
- **Objective of the research project:** 4 original papers published on international peer-reviewed journals.
- **Number of hours of frontal teaching per year:** 20
- **Admission requirement:** High School of Specialization in Medical Oncology or equipollent qualification.
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company/abroad**: A 6-month research period at a foreign company is scheduled, the company will be identified by the Department.

ATTACHMENT 37

The specific elements of this procedure are as follows:

- **Department:** Department of Experimental, Diagnostic and Specialty Medicine - DIMES
- **SC:** 06/D2 - ENDOCRINOLOGY, NEPHROLOGY, FOOD AND WELLNESS SCIENCE
- **SSD:** MED/14 – NEPHROLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** E-health, diagnostica avanzata, medical devices e mininvasività.
- **PNR topics and articulations:** Ambiti: 5.1 Salute (PNR2021-2027); Articolazione 5: Valutazione dell'impatto dell'ambiente sugli outcomes di patologie acute e cronico degenerative (PNR2021-2027).
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Medical assistance services:** The researcher will perform medical care services at the hospital facility of Ospedale Sant'Orsola - U.O. di Nefrologia Dialisi e Trapianto.
- **Project title:** GREEN NEPHROLOGY. Toxicity from contaminants of the food chain and kidney disfunction in normal, renal transplant and dialysis subjects.
- **Brief description of the project:** The kidneys are susceptible to the effects of toxins and pollutants. The characterization of the renal effects on both healthy and kidney transplant patients, as well as on dialysis, through analysis methods of signal transduction in the presence of organ injury. The effects linked primarily to DNA methylation, histone modifications and on another side of T-cell exhaustion, which are associated with the detection of toxins in blood and tissues, as well as the analysis of interrelationships in the kidneymicrobiota axis are of interest. The project aims to evaluate from a clinical point of view and with the support of molecular, cellular and cytometric biology methods, the effect in the various nephrological areas, linked to toxic substances, of food origin in terms of reduction of glomerular filtrate and vascular and metabolic damage also in order to implement environmental protection strategies and establish safe levels of exposure to toxic pollutants deriving from the food chain.
- **Objective of the research project:** In the 3 years of activity envisaged, the researcher must produce at least 3 communications at national and international conferences and at least 2 articles in indexed international journals relating to the topics covered by the project.
- **Number of hours of frontal teaching per year:** 40
- **Admission requirement:** High School of Specialization in Nephrology or equipollent qualification.
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 38

The specific elements of this procedure are as follows:

- **Department:** Department of Experimental, Diagnostic and Specialty Medicine - DIMES
- **SC:** 06/F2 - OPHTHALMOLOGY
- **SSD**: MED/30 - OPHTHALMOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita**.**
- **Areas of development of the project SNSI:** Sistemi per la sicurezza dell'ambiente urbano, il monitoraggio ambientale e la prevenzione di eventi critici o di rischio.
- **PNR topics and articulations:** Ambito: Salute 1.1 temi generali; Articolazione 5. Valutazione dell'impatto dell'ambiente sugli outcomes di patologie acute e cronico-degenerative.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Medical assistance services:** The researcher will perform medical care services at the hospital facility of Ospedale Sant'Orsola - UO Oftalmologia.
- **Project title:** Early estimation of the impact of pollutants in exposed mucous tissues - data for a change in urban morphology.
- **Brief description of the project:** The levels of pollutants in the urban environment have a very heterogeneous distribution, and it is complex in epidemiological studies to evaluate their effect in relation to exposure. The immune system defense is impaired by pollutants, and the exposed mucosa of the eye and nose are the first site of contact and accumulation. These tissues may represent indicators for an early estimate of health damage. This project aims to correlate the levels of pollutants to the clinical, biochemical, morphological and microbiological modifications of the conjunctival and nasal mucosa and the fluids that cover them in subjects living in different urban contexts. The study can provide real-time evidence for sustainable city planning, improve the environmental quality of built areas, meet residents' quality of life and health needs, and increase evidence for the development of green architecture. The project involves a clinical trial on patients.
- **Objective of the research project:** During the duration of the contract, the researcher must be the author of at least 8 articles in peer-reviewed international journals and participate in at least 2 national or international scientific meetings with scientific contributions related to the themes of the green transition.
- **Number of hours of frontal teaching per year:** 24
- **Admission requirement:** High School of Specialization in Ophthalmology or equipollent qualification.
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 39

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
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, Energia e Ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Ambito 5.6.3: Bioindustria per la bioeconomia - Articolazione 4: Modelli di business innovativi per la moderna bioeconomia.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Corporate emission targets: implications for corporate finance.
- **Brief description of the project:** In the transition process towards an economy with net zero emissions, the mounting pressure from both investors and regulators pushes companies to adopt emission reduction plans and to periodically report on their progress in achieving those emission targets. This project aims at investigating potential implications of the adoption of corporate emission targets for corporate finance, with a special focus on: a) corporate governance decisions; b) capital and debt structure choices. The position is associated with a research visiting period in a company of at least 6 months.
- **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 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. It is also expected that research results be presented internationally. The researcher must participate actively and consistently to the department activities and contribute significantly to their enhancement.
- **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**: English language
- **Research period in a company**: A period of research of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 40

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/11 - FINANCIAL MARKETS AND INSTITUTIONS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, Energia e Ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Articolazione 4. Applicazione di nuovi modelli economici per la sostenibilità e la resilienza.
- **Main place of employment:** Forlì
- **Contract type:** Full-time
- **Project title:** Green Transition Business Model and Financial Innovation.
- **Brief description of the project:** The financial sector is the main booster for economic and social development, and it represent the link to the green transition and overcoming the pandemic crisis. The opportunities and constraints of ESG-induced regulation are increasingly impacting financial regulation, wealth management products, risk assessment and the definition of financing needs for companies and households. The internship at the enterprise-bank aims to verify the results of the research in a market context and compliance requirements. A development of skills and a strong exchange with the production context is expected to obtain measurable and quantifiable results, in line with the reference actions and with the objectives of the PON.
- **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 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 1,5 or at least 9 Scopus citations in the last five years. It is also expected that research results be presented internationally. The researcher must participate actively and consistently to the department activities and contribute significantly to their enhancement.
- **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**: English language
- **Research period in a company**: A period of research of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 41

The specific elements of this procedure are as follows:

- **Department:** Department of Biological, Geological, and Environmental Sciences - BiGeA
- **SC:** 04/A1 – GEOCHEMISTRY, MINERALOGY, PETROLOGY, VOLCANOLOGY, EARTH RESOURCES AND APPLICATIONS
- **SSD**: GEO/09 - MINING RESOURCES, MINERALOGIC AND PETROGRAPHIC APPLICATIONS FOR THE ENVIRONMENT AND FOR CULTURAL HERITAGE
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **PNR topics and articulations:** Ambito PNR: Green technologies; Articolazione 3 PNR: Prevenzione della contaminazione del suolo e delle acque.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title**: Defining strategies for recycling and environmental monitoring of mine tailings at different scales: examples from the large to the small scales (Huludao district –China; Libiola Mine – Liguria, Italy).
- **Brief description of the project:** The activities that will be carried out during the 3-year period of this project will consist in a combination of a multi-scale and multi-technique analytical approach to the study of the tailings from the selected mine sites. Such approach will involve large- to small-scale geological documentation, field documentation and sampling, as well as the definition of a set of petrographic, mineralogical, and chemical analytical techniques for the identification of grades and tonnages of the ore minerals and other possible raw materials in the tailings.
- **Objective of the research project:** Over the three-year period, the researcher will aim at producing at least three publications in international peer-reviewed journals, two of which as first author. Also, the researcher is expected to present the results of his/her work in national and/or international scientific conferences. The researcher will also have to play an active role in the preparation of project proposals and will participate in national and international research projects.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company/abroad**: A research period of 6-12 months is scheduled (even at a foreign company), the companies will be identified by the Department.

ATTACHMENT 42

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/05 – ZOOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** 6: PRODOTTI ALIMENTARI, BIOECONOMIA, RISORSE NATURALI, AGRICOLTURA, AMBIENTE- Articolazione PNR 6.5: Conoscenza, innovazione tecnologica e gestione sostenibile degli ecosistemi marini in specifico Articolazione 6.5.6. Costruzione di modelli di gestione basati sull'approccio ecosistemico.
- **Main place of employment:** Ravenna
- **Contract-type:** Full-time
- **Project title**: AdriBlueTransIT – It's time for a change: thrusting the Blue transition of Adriatic marine fishery towards innovative processes and products with high-value of industrial and ecosystem sustainability.
- **Brief description of the project:** The Research Contract will carry out the following interdisciplinary research activities 1) retrieve and assemble from existing platforms quali-quantitative data (life-cycle traits, environmental, ecosystem and fishery) of target halieutic resources (Deliverable#1: resource databases) 2) integrate existing and novel results obtained from predictive end-to-end ecosystem models (D#2: resource assessment and forecast 3) design and implement changes in fishery management (D#3: guidelines and pilots for fishery transition) 4) improve industrial sea-to-fork processes involving fishery SMEs to obtain eco-innovative seafood products, including the energy transition to low-emission vessels (D#4: guidelines for process innovation and seafood products 5) launch awareness campaigns and implement initiatives involving coastal communities to start-up green solutions (D#5: guidelines and piloting initiatives for social transition).
- **Objective of the research project:** Over the three-year period, the researcher's scientific productivity objectives will be aimed at producing publications in international peer-reviewed journals, in number of at least 6 publications over the three-year period, of which at least 3 as the lead author, as well as the presentation of the results obtained at national and/or international scientific conferences. The researcher will also have to play an active role in the preparation of project proposals and in participation in national and international research projects.
- **Number of hours of frontal teaching per year:** 60
- **Admission requirement:** Phd
- **Maximum number of publications:** 14
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company/abroad**: A research period of 6 months at a foreign company is scheduled, the company will be identified by the Department.

ATTACHMENT 43

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
- **Thematic area:** Innovation
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Medicina rigenerativa, predittiva e personalizzata.
- **PNR topics and articulations:** Ambito: Salute; Articolazione: Dispositivi medicali, organi artificiali e tecnologie neuromorfiche per la medicina bionica e rigenerativa.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Innovative AI systems from neuroscience.
- **Brief description of the project:** The researcher will contribute to the design of a new AI technology that can be integrated into different types of motor actuators (robotic arm, exoskeleton) and that, by combining both neural and behavioral signals, is able to interact with the user of the technology, typically the patient and their caregivers. By exploiting the most recent knowledge in the field of neurophysiology, the researcher will study how motor and sensory information is integrated both from a neural and biomechanical point of view in the biological system and subsequently how this can be implemented in an AI system in an effective and safe way. The expected results will contribute to the partial or complete recover of motor functions. The impact will be in the field of scientific research, but also in the society and economy, as the results can contribute to the development of highly advanced and innovative technologies that can be included in a new generation of rehabilitation protocols. **Objective of the research project:** The scientific productivity objectives of the project are set out in: 1) the publication of at least two original papers in international journals subject to "peer review"; 2) RTD presentation of the results in international meetings; 3) involvement of the RTD in research projects granted by international funding agencies and contribution to the achievement of the project deliverables; 4) training of young scientists through their bachelor and master's theses and of PhD students, as cotutor/tutor; 5) involvement in enhancing the innovation and the exchange of expertise between research and production and qualify the research activities in innovation sectors.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 44

The specific elements of this procedure are as follows:

- **Department:** Department of Biomedical and Neuromotor Sciences - DIBINEM
- **SC:** 05/H1 - HUMAN ANATOMY
- **SSD**: BIO/16 - HUMAN ANATOMY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** E-health, diagnostica avanzata, medical devices e mini invasività.
- **PNR topics and articulations:** Grande Ambito: Salute - Articolazione: 1.3 Biotecnologie; 2: Medicina rigenerativa, trapianti d'organo ed ingegneria dei tessuti.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** HIC MORS GAUDET SUCCURRERE VITAE "ET PLANETIS?
- **Brief description of the project:** Although there are multiple anatomical artificial models, the cadaver study remains the gold standard to ensure comparable patient results. Furthermore, the body, already existing in nature, does not lead to an increase in pollution related to the production of expensive and often non-reusable artificial models. The aim of the project is to optimize the use of the bodies of the post-mortem body donation program of the UNIBO Human Anatomy Center to ensure the lowest possible environmental impact. The project aims to verify the environmental impact of 30 corpses compared with their respective artificial alternatives and related management processes, in order to assess "whether death can be happy to help life, but also the planet". The donation of the body must be encouraged because it represents not only a gesture of philanthropy, but also of sensitivity towards the environment. The project involves the collaboration with Zaccanti spa.
- **Objective of the research project:** Publication of at least two peer-reviewed articles in international journals on topics relevant to the research activity; participation in national and international conferences and congresses with contributions relevant to the research project.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A research period abroad of 6 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 45

The specific elements of this procedure are as follows:

- **Department:** Department of Biomedical and Neuromotor Sciences - DIBINEM
- **SC:** 06/D6 - NEUROLOGY
- **SSD**: MED/26 - NEUROLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita (PON 2014-2020).
- **Areas of development of the project SNSI:** E-Health, diagnostica avanzata, medical devices e mini invasività (PON 2014-2020).
- **PNR topics and articulations:** - Ambito: Salute; - Articolazioni: Digital health: telemedicina, tecnologie digitali e sensoristica per la medicina preventiva, partecipativa e personalizzata e per l'innovazione dei servizi sanitari e dell'ingegneria clinica.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Medical assistance services:** The researcher will perform medical care services at the hospital facility of ASL di Bologna - CLINICA NEUROLOGICA – IRCCS Istituto delle Scienze Neurologiche di Bologna.
- **Project title:** Reducing the environmental impact by improving the management of patients with neuromuscular disorders: the model of myasthenia gravis.
- **Brief description of the project**: The project aims to improve the care of patients with neuromuscular disorders by simultaneously reducing the healthcare footprint, using as model myasthenia gravis, an autoimmune disease of the neuromuscular junction burdened by high disability and by the risk of rapid clinical deteriorations requiring immediate care. The candidate will have to: 1) implement multidisciplinary evaluation by creating an integrated clinical pathway that also includes the use of virtual platforms for interdisciplinary discussion; 2) implement telemedicine assessments; 3) implement remote clinical monitoring by setting up a specific mobile app connected to a wearable device for monitoring physiological parameters (i.e. respiratory rate, heart rate, etc.) to verify the possibility of intercepting and possibly predicting clinical exacerbations.
- **Objective of the research project:** The RTDA will produce an annual report on the progress of the work, with specific reference to the implementation of the innovative clinical assessment methods envisaged by the project and the construction of the app for the detection of physiological parameters. The candidate will then produce, at the end of the 36 months, a final report on the research objectives of the project. He/she must also produce at least4 scientific publications relating to the project and participate as a speaker to at least 2 national and international conferences on the themes of the project.
- **Number of hours of frontal teaching per year:** 60
- **Admission requirement:** High School of Specialization in Neurology or equipollent qualification.
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 46

The specific elements of this procedure are as follows:

- **Department:** Department of Biomedical and Neuromotor Sciences - DIBINEM
- **SC**: 06/F1 – ORAL DISEASES AND DENTISTRY
- **SSD**: MED/28 - ORAL DISEASES AND DENTISTRY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Medicina rigenerativa, predittiva e personalizzata.
- **PNR topics and articulations:** - Ambito 1. Salute; 1.3 Biotecnologie; - Articolazione 5. Biotecnologie microbiche.
- **Main place of employment:** Bologna
- **Contract type:** full-time.
- **Project title:** Resorbable biopolymers with controlled release of antimicrobial agents for the treatment of oral bone lesions induced by anaerobic pathogenic bacteria.
- **Brief description of the project:** The aim of the present project is to synthetize and develop biodegradable gels and customized 3D-printed scaffolds for the rehabilitation of bone defects induced by infective pathologies of the oral cavity. The scaffolds will be produced through 3D printing and using a green eco-friendly methodology. The biomaterials will be characterized for their chemical-physical (porosity, biodegradability, biointeractivity), biological (biocompatibility, antimicrobial properties) and thermomechanical properties (melting point, compression test, tensile test, flexibility). The synthesis and the 3D printing of the biomaterials will be made in collaboration with Cefla and Sweden &Martina companies. Biological tests and antimicrobial molecule incorporation will be performed in collaboration with Fidia Farmaceutici and Dompè.
- **Objective of the research project:** Throughout the duration of the project, the researcher will have to publish at least 6 papers in the field of green and sustainable research. These papers should be included in top scored, peer-reviewed international journals (indexed in Wos, Scopus, JCR-ISI).
- **Number of hours of frontal teaching per year:** 60
- **Admission requirement:** PhD
- **Maximum number of publications:** 20
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 47

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:** 2
- **Thematic area:** Green
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Riduzione dell'impatto ambientale (green engine).
- **PNR topics and articulations:** Ambito PNR: 2. GRANDE AMBITO DI RICERCA E INNOVAZIONE: CULTURA UMANISTICA, CREATIVITÀ, TRASFORMAZIONI SOCIALI, SOCIETÀ DELL'INCLUSIONE - 2.5 Trasformazioni sociali e società dell'inclusione - Articolazione 8. Modelli di sviluppo, competenze e formazione; Articolazione 3. Disuguaglianze e inclusione.
- **Main places of employment:** Bologna and Rimini
- **Contract-type:** Full-time
- **Project title:** The ecological challenge: innovative educational practices and the design of new community services.
- **Brief description of the project:** a) Needs analysis and state of the art: one researcher will be in charge to review the multidisciplinary scientific literature in order to reconstruct the state of the art related to Sustainability Science and Environmental Education. Through qualitative research in educational contexts and in synergy with the company, the other researcher will map the existing good practices and, within them, the elements that, raising the awareness of ecological and environmental issues, can help to strengthen community ties; b) Identification of new tools and methodologies: grounding on the finding emerged from the previous analysis, the researchers will design innovative solutions and applications which can be used for the development of sustainable practices of environmental education to be implemented and delivered by Wonderful Education.
- **Objective of the research project:** In the Framework of the recent socio-educational studies and the goals of UN Agenda 2030 for sustainable development highlighting the relationship between environmental complexity, technologies and community learning, the project aims at supporting Wonderful Education, srl. in the educational field, and Future Education Modena (FEM) - the first Italian EdTech hub, in the educational planning of innovative experiences and services (aimed at the public and / or private sector). Through the proposal of educational paths and initiatives, the project will promote in the recipients new habits and a new sensitivity regarding the effects that individual and collective behaviour can produce on the environmental and atmospheric balance: the reference is not only to pollution, but also to the imbalances and excesses due to anthropization. The project addresses the professional preparation of two socio-pedagogical profiles characterized by a strong interdisciplinary approach, who in connection with social and health services are able to develop tools and practices of environmental education and consistent community and citizenship practices coping with the emerging ecological challenges. Adopting an intersectional approach, the project aims to deepen more specifically the interdependence between environmental systems and the development of virtuous practices of ecological education and environmental sustainability. Moreover, it foresees the realization of an action-research in the field of Sustainability Science (Green Science, Citizen Science and Food Science) aimed at the development and implementation of good educational practices and

the design of possible sustainable solutions in different contexts, both at local and global level.

- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 48

The specific elements of this procedure are as follows:

- **Department:** Department of Education Studies "Giovanni Maria Bertin" - EDU
- **SC:** 11/D2 – METHODOLOGIES OF TEACHING, SPECIAL EDUCATION AND EDUCATIONAL RESEARCH
- **SSD:** M-PED/03 – METHODOLOGIES OF TEACHING AND SPECIAL EDUCATION
- **Number of positions:** 1
- **Thematic area:** Innovation
- **Thematic Area SNSI:** Tourism, Cultural Heritage and Industry of Creativity.
- **Areas of development of the project SNSI:** Systems and applications for tourism and for the enjoyment of culture; Technologies and applications for the conservation, management and enhancement of cultural, artistic and landscape heritage; Technologies for advanced design.
- **PNR topics and articulations:** Humanistic culture, creativity, social transformations, society of inclusion, two articulations: Development of technologies to support widespread heritage and less known; Participatory approach to cultural heritage.
- **Main place of employment:** Bologna
- **Contract type**: Full-time
- **Project title:** Artificial intelligence and cultural heritage: elaboration of predictive models for the mediation and use of cultural heritage.
- **Brief description of the project:** In a constantly changing scenario, where the digital connection is becoming more and more pervasive, research must design cultural environments that are increasingly accessible and open to social heterogeneity, in a productive and educational tension between heritage and the local community. This implies that the person and the community are placed at the center of an inclusive and participatory learning process, aimed at bridging cultural, social and territorial gaps. Digital platforms with a high level of accessibility allow the development of greater participation, generating a new interpretation and a different vitality of the heritage as a relational, social, communicative and shared asset.
- **Objective of the research project:** Elaboration of predictive models for the mediation and use of cultural heritage includes two main work phases: a) analyze the scientific literature aimed at investigating the national and international state of the art on the theme of the enhancement of cultural heritage through advanced technological tools, highlighting the incident factors; b) design a predictive model centered on AI algorithms applied to the field of heritage education that can have an impact on the participatory and inclusive practices of communities.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 49

The specific elements of this procedure are as follows:

- **Department:** Department of Agricultural and Food Sciences - DISTAL
- **SC:** 07/B2 – ARBORICULTURE AND FOREST SYSTEMS
- **SSD:** AGR/03 – ARBORICULTURE AND FRUITCULTURE
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** 5.4.3 Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** 5.5.3 Salute, alimentazione, qualità della vita: Traiettorie tecnologiche di sviluppo a priorità nazionale.
- **PNR topics and articulations:** 5.6.4 Conoscenze e gestione sostenibile dei sistemi agricoli e forestali - Articolazione 1. Miglioramento sostenibile delle produzioni primarie.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Adaptation of fruit and grape cropping systems in response to Climate Change, to boost farming sustainability and competitiveness through adoption of state-of-the-art precision agriculture approaches.
- **Brief description of the project:** This project is aligned with the objectives of the PON Green Line, as well as SNSI and PNR, and focuses on the development and assessment of resilient fruit and grape cropping systems, to boost the sustainability (environmental, ethical and economic) of farming operations. The work will develop innovative solutions to reduce the environmental impact of fruit/grape production, including by genetic resources, novel approaches to irrigation/fertigation, canopy and orchard/vineyard floor management, including the adoption of stateof-the-art precision fruit-viti-culture solutions, to achieve the objectives of the green transition, ecosystems and biodiversity conservation, and the mitigation of climate change impacts. The research activity will be compliant with the guidelines specified in the SNSI and PNR and will include a 6 months period within a company, to be identified by the Department, to transfer the best practices assessed in the project.
- **Objective of the research project:** During the three years, the publication of at least 3 peer-reviewed papers, on ISI/Scopus indexed journals; the presentation of at least 3 oral/poster contributions at international/national symposia.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 50

The specific elements of this procedure are as follows:

- **Department:** Department of Agricultural and Food Sciences - DISTAL
- **SC:** 07/E1 - AGRICULTURAL CHEMISTRY, AGRICULTURAL GENETICS AND PEDOLOGY
- **SSD:** AGR/07 - AGRICULTURAL GENETICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** 5.4.3 Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** 5.5.3 Salute, alimentazione, qualità della vita: Traiettorie tecnologiche di sviluppo a priorità nazionale.
- **PNR topics and articulations:** - 5.6.4 Conoscenza e gestione sostenibile dei sistemi agricoli e forestali - Articolazione 1. Miglioramento sostenibile delle produzioni primarie; Articolazione 2. Sicurezza e qualità delle produzioni primarie; - 5.6.2 Scienze e tecnologie alimentari - Articolazione 5. Fonti proteiche e loro utilizzo nelle tecnologie alimentari.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Structural and functional genomics for sustainable and resilient crops.
- **Brief description of the project:** The genetic improvement of plants faces multiple challenges such as the development of new cultivars that maintain or increase yield, are suitable for production systems with a reduced environmental impact and are resilient to abiotic stresses related to the ongoing climate crisis. In this project the candidate will use up-to-date molecular genomics tools such as SNP array, NGS sequencing, transcriptome analysis, to characterize structural and functional genetic variation present in the germplasm collections of durum wheat and other grains. Emphasis will be given to the characterization of variation in local cultivars (landraces). The final goal is to associate the genetic variation observed with traits of agronomic impact (e.g. tolerance to abiotic stresses such as drought and heat), to favor the adoption of this knowledge in breeding for the development of new cultivars suitable for sustainable and resilient agricultural systems.
- **Objective of the research project:** The candidate will have to carry out structural and functional genomic analyzes aimed at genetic mapping, directly or through the use of markers, genes and / or loci in durum wheat and other cereals, for resistance to abiotic stress (e.g. drought) and / or biotic (e.g. fungal diseases), favoring the development of cultivars resilient to climate change and suitable for reduced chemical inputs, Therefore in line with the thematic of green transition, ecosystem conservation, biodiversity and reducing the impacts of climate change. Quantifiable target: three scientific publications in peer-reviewed journals indexed in ISI / SCOPUS.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Language chosen by the candidate between Italian and English. Candidates choosing Italian, will also have to demonstrate the adequate knowledge of the English language.
- **Research period in a company**: A period of 6-8 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 51

The specific elements of this procedure are as follows:

- **Department:** Department of Agricultural and Food Sciences - DISTAL
- **SC:** 07/D1 - PLANT PATHOLOGY AND ENTOMOLOGY
- **SSD:** AGR/11 - GENERAL AND APPLIED ENTOMOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI**: Sviluppo dell'agricoltura di precisione e l'agricoltura del futuro.
- **PNR topics and articulations**: 5.6.4 Conoscenza e gestione sostenibile dei sistemi agricoli e forestali - Articolazione 4. Attività agricola e forestale a protezione dell'ambiente e delle risorse naturali; Articolazione 5. Sistemi agricoli e forestali per la salvaguardia e la valorizzazione del territorio.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Role of insect functional biodiversity to sustain ecosystem services toward green transition.
- **Brief description of the project:** Beneficial insects play the important role of providing ecosystem services in sustainable agriculture, contributing to resilience in cultivated environments. Through the agroecological management of landscape it is possible to enhance biological control and pollination. These ecological infrastructure management techniques contribute to the resilience of many cultivated systems and include strategies such as growing flowering plants and the implementation of field margin complex, including annual and perennial plants. In this project, ecosystem services will be enhanced in the agricultural landscape through: 1. conservation of biological control agents and pollinators by ecological infrastructure management; 2. biological control by rearing and releasing biological control agents against recently introduced exotic insects. Both sub-projects are focused towards the reduction of pesticides and a transition to green agriculture.
- **Objective of the research project:** During the three years, 2 publications ISI/Scopus and 2 presentations at international/national symposia.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 52

The specific elements of this procedure are as follows:

- **Department:** Department of Agricultural and Food Sciences - DISTAL
- **SC:** 07/G1 - ANIMAL SCIENCE AND TECHNOLOGY
- **SSD:** AGR/17 - LIVESTOCK SYSTEMS, ANIMAL BREEDING AND GENETICS
- **Thematic Area SNSI:** 5.4.3. Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Sviluppo dell'agricoltura di precisione e l'agricoltura del futuro.
- **PNR topics and articulations:** 5.6.4 Conoscenza e gestione sostenibile dei sistemi agricoli e forestali - Articolazione 1 - Miglioramento sostenibile delle produzioni primarie, Articolazione 4 - Attività agricola e forestale a protezione dell'ambiente e delle risorse naturali, Articolazione 5 - Sistemi agricoli e forestali per la salvaguardia e la valorizzazione del territorio.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Applied genomics for sustainable animal production system.
- **Brief description of the project:** The project is included in the GREEN thematic area: its main aims are i) the reduction of the environmental impact of the livestock systems by reducing green-house gas emissions of the animals, ii) the implementation of mitigation actions against the effects of climate change on farm animals with the improvement of their resilience and adaptation against heat stress and heat waves, iii) the conservation of animal genetic resources and iv) the valorization of livestock productions. The project applies precision livestock farming approaches derived by the design of appropriate breeding and selection plans of the animals and conservation and valorization of local breeds. The project is focused on applied genomics, phenomics, and environmental sciences. The project produces and analyses big data derived from genomic, phenomic and environmental analyses. It includes a period of research activities of 6 months in an enterprise and the transfer of the innovations to stakeholders.
- **Objective of the research project:** 5 ISI/Scopus publications, 2 communications to national and/or international congresses, inclusion in the research team or coordination of at least one national or international research project.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Language chosen by the candidate between Italian and English. Candidates choosing Italian, will also have to demonstrate the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is foreseen, the company will be identified by the Department.

ATTACHMENT 53

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:** 1
- **Thematic area:** Innovation
- **Thematic Area SNSI:** Turismo, Patrimonio culturale e industria della creatività; Tecnologie per il Patrimonio Culturale.
- **Areas of development of the project SNSI:** Sistemi e applicazioni per il turismo, la fruizione della cultura e l'attrattività del Made in Italy.
- **PNR topics and articulations:** Missione 1: "Digitalizzazione, innovazione, competitività, cultura e turismo". In particolare può contribuire alla realizzazione dell'Investimento 1.1. (Strategia digitale e piattaforme per il patrimonio culturale) e 3.2 (capacity building per gli operatori per gestire la transizione digitale), grazie al percorso partecipato di cocreazione di nuove imprese digitali. Infine, il progetto ricorrendo alla co-creazione fra ricercatori e stakeholder contribuisce all'innovazione e all'interscambio fra mondo della ricerca e mondo produttivo.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Towards new forms of digital firms for the promotion of cultural sustainability.
- **Brief description of the project:** The creative industry has changed in recent years and the pandemic has accelerated this trend. Digital platforms have become the main drivers of change, allowing a growing differentiation of the cultural offer and favoring the promotion of new cultural opportunities developed by new generation creative companies. The digital transformation has in fact stimulated the birth of new forms of business, from the platforms of large companies to digital cooperatives. Digital companies therefore represent an opportunity to strengthen the cultural production of nations and communities. However, businesses operating in the creative industries sector are often small and suffer from economic and financial sustainability problems. These weaknesses make it difficult to enjoy cultural rights and contribute to the disparities in terms of size and rate of growth that have emerged between the activities of the cultural sector and alternative sectors.
- **Objective of the research project:** The objective of this project is to identify and co-design, together with the actors of the ecosystem of the creative industries, new forms of digital enterprise and new fruition processes that make it possible to promote the different and multiple cultural expressions and improve economic sustainability of European cultural enterprises. To this end, the project will also develop new methodologies for measuring the economic and cultural impact of creative industries.
- **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**: English language
- **Research period in a company**: A 6-month research period in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 54

The specific elements of this procedure are as follows:

- **Departments**: Department of Economics – DSE and Department of Statistical Sciences "Paolo Fortunati" - STAT
- **SC:** 13/A2 – ECONOMIC POLICY
- **SSD:** SECS-P/02 – ECONOMIC POLICY
- **Number of positions:** 2
- **Main place of employment:** Rimini
- **Contract type:** Full-time
- **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**: English language
- **Research period in a company**: Both researchers will have to carry out a research period of 6 months in a company. The companies will be identified by the Departments.
- **Description of the projects and their specific elements**:
  1) **Project 1** – Department of Economics – DSE, **project title**: Green transition in tourism destinations: theory and evidence.
     Brief description of the project: Despite its relevant economic contribution, tourism suffers a significant delay in the green transition, due to its nature as a heterogeneous system of firms offering complementary services, and because of the key role played by the use / exploitation of natural resources in its production. Tourism services also have a diversified impact on the environment, requiring strategies to address the externalities stemming from complementarity and to limit the negative impacts on connected sectors. The project will investigate the theoretical and empirical aspects of the green transition in tourism destinations, with special reference to the need of coordination between suppliers within the destination (including the development of sustainable mobility), as well as overcoming the COVID-19 pandemic through a tourism model able to tackle the current climate crisis. Central to the project will be the collaboration with the destination management of Rimini (Strategic Plan Agency).
     Objective of the research project: Tourism contributes heavily to greenhouse gas emissions (especially for transport) and is strongly influenced by climate change. Moreover, as it is based on mobility and sociality, it is one of the sectors most affected by the pandemic. The objective of studying green transition models for tourism destinations is therefore consistent with the aims of overcoming the effects of the pandemic and defining a green, sustainable and resilient recovery in the current climate crisis framework. The expected results (with related impacts) are: 1. Estimation of the adaptation of the tourism system to climate change and to (green) consumer preferences; Impact: change in CO2 emissions at the destination in the presence of different environmental and consumption scenarios; 2. Analysis of the environmental externalities deriving from the lack of coordination between companies. Impact: identification of effective destination coordination / management strategies.
     Thematic area: Green
     Thematic Area SNSI: Turismo, Patrimonio culturale e industria della creatività.
     Areas of development of the project SNSI: Sistemi e applicazioni per il turismo, la fruizione della cultura e l'attrattività del Made in Italy
     PNR topics and articulations: Grande Ambito di Ricerca: Clima, energia, mobilità sostenibile) nelle sue Articolazioni di Ricerca: (i) Mobilità Sostenibile; (ii) Cambiamento Climatico, mitigazione e adattamento. In queste articolazioni, le Priorità di Ricerca

coerenti con il progetto sono: (i) Travel behaviour e modal choice (domanda di mobilità); (ii) Mobilità turistica e turismo della mobilità; (iii) Valutazione dell'efficacia e della sostenibilità delle misure di mitigazione; (iv) Sviluppo di strategie e azioni per l'attuazione di interventi di adattamento climatico.

2) **Project 2**: Department of Statistical Sciences "Paolo Fortunati" - STAT, **project title:** Digital innovation in two-sided markets: the strategies of Italian platforms as a response to the competitive policies of Big Tech.
Brief description of the project: The project consists in the creation of an industrial economics theoretical model to describe how sellers, buyers, platforms and policy-markets interact, in order to analyse the response of agents to shocks such as national and international policies, or to other shocks. The model must be tested by using data coming from the markets, through the collaboration with a firm operating in the Italian digital market, with the aim of suggesting possible reactions to policies or shocks, by using digital innovation tools. These tools could be actually used by the firm, testing it on its users with an empirical approach.
Objective of the research project: The expected outcome for the three-year research project consists in three research products, including working papers and institutional reports. One of these products is expected to appear in a highly reputed international journal or, alternatively, two of them are expected to appear in international journals. Furthermore, in line with the objectives defined in the PNR, the project identifies the investment priorities of the SNSI in the national thematic area "Industria intelligente e sostenibile, energia e ambiente", in the area "Agenda Digitale, Smart Communities, Sistemi di mobilità intelligente" and in the trajectory "Tecnologie per la diffusione della connessione a Banda Ultra Larga e della web economy". In particular, the project aims at the adoption of key enabling technologies to create value through investments in research and development generating innovative services for Smart Communities.
Thematic area: Innovation
Thematic Area SNSI: Industria intelligente e sostenibile, energia e ambiente; Agenda Digitale, Smart Communities, Sistemi di mobilità intelligente.
Areas of development of the project SNSI: Tecnologie per la diffusione della connessione a Banda Ultra Larga e della web economy.
PNR topics and articulations: Ambito di ricerca 5.4. DIGITALE, INDUSTRIA, AEROSPAZIO e relativa area di intervento 5.4.2 High performance computing e big data.

ATTACHMENT 55

The specific elements of this procedure are as follows:

- **Department:** Department of Economics - DSE
- **SC:** 13/A5 – ECONOMETRICS
- **SSD:** SECS-P/05 – ECONOMETRICS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale.
- **PNR topics and articulations:** Ambito ricerca e innovazione: Clima, energia e mobilità sostenibile, Section "Cambiamento climatico, mitigazione e adattamento". Points (i)-(iii) of the project relate to the Articolazioni 2, 3, 4, 6 and 8, points (iv) - (v) to the Articolazioni 4, 6 and 8.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Econometrics of climate change.
- **Brief description of the project:** The project applies frontier econometric methodologies to the study of the economic effects of climate change and policy design. Phase I develops macroeconometric models with climate risks and climate-economy interactions to (i) assess spillovers of climate shocks across sectors/regions, (ii) measure climate-related uncertainty and "compound risk" (e.g., the COVID-19 pandemic) (iii) define macro-climate scenarios. Phase II focuses on (iv) financial econometric models to estimate how climate risks are priced by financial markets and (v) how climate-related events affect financial portfolios and volatility. The activities coordinated with Prometeia S.p.A. will involve the estimation of losses on real and financial assets due to adverse climate events, the study of insurance systems for physical risks, the evaluation of transition risk on portfolios and methods for improving the ESG scoring of investments.
- **Objective of the research project:** From the 1st to the 18th month, the project will develop macro models with climate risks: point (i) (see Description) from the 1st to the 6th month, points (ii)-(iii) from the 7th to the 18th month. At the end of phase I, two working papers will be produced. From the 19th to the 36th month, the financial models will be developed: point (iv) from the 19th to the 30th month, point (v) from the 31st to the 36th month. At the end of phase II, two additional working papers are expected. Overall, two articles will be submitted to top journals in econometrics/economics.
- **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**: English language
- **Research period in a company**: A 6-month research period in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 56

The specific elements of this procedure are as follows:

- **Department:** Department of Legal Studies - DSG
- **SC:** 12/A1 - PRIVATE LAW
- **SSD:** IUS/01 - PRIVATE LAW
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Sistemi e tecnologie per il packaging, la conservazione e la tracciabilità e sicurezza delle produzioni alimentari.
- **PNR topics and articulations:** Ambito sensi del PNR: 5.6. PRODOTTI ALIMENTARI, BIOECONOMIA, RISORSE NATURALI, AGRICOLTURA, AMBIENTE; Articolazione ai sensi del PNR: Articolazione PNR 4. Alimentazione sana e sostenibile.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Consumer education and corporate responsibility in the Farm to Fork Strategy.
- **Brief description of the project:** The activity of the Researcher will consist in the development of a survey aimed at identifying the tools that, within the private law system, will trigger lifestyles and eating habits in compliance with the canons of sustainable development, health protection, environment protection, animal welfare and the reduction of food waste. The scientific activity will be accompanied by that carried out within the company and aimed at the empirical testing of the solutions outlined on a theoretical level. During the three-year period, particular importance will be covered by the dissemination of the research activity which will take place, first of all, through the organization of conferences and participation in them as a speaker. A significant activity of organizing workshops involving institutions, consumer associations and businesses is also envisaged as part of the so-called "Third Mission".
- **Objective of the research project:** The Researcher will carry out a scientific research activity focused on the analysis of the private law relationships that characterize the relationship between business and consumer. In this perspective is planned the publication of three articles for Class A journals. They will focus respectively on the problem of communication conveyed through labeling, on the value of certifications and on the fundamental role they play in promoting consumer awareness and on the synergy between private enforcement and public enforcement tools with in achieving the goal of outlining a system of production and marketing of food products that, in every segment of the supply chain, complies with the requirements of health and environmental protection, biodiversity and the reduction of food waste.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 57

The specific elements of this procedure are as follows:

- **Department:** Department of Legal Studies - DSG
- **SC:** 12/E2 - COMPARATIVE LAW
- **SSD:** IUS/02 - COMPARATIVE PRIVATE LAW
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Smart and sustainable industry, energy and the environment.
- **Areas of development of the project SNSI:** Innovative production processes for high efficiency and industrial sustainability.
- **PNR topics and articulations:** Humanistic culture, creativity, social transformations, society of the inclusion, Social transformations and society of inclusion, Section 7 Innovation, democracy, ethics and law.
- **Main place of employment:** Bologna
- **Contract type:** Defined-time
- **Project title:** China and Europe for the green transition in the background of the EU-China Comprehensive Agreement on Investment (CAI): a comparative law study.
- **Brief description of the project:** In December 2020 the EU and China concluded the CAI that is still moving forward, even with difficulties linked to the diplomatic tensions. Beside the new legal framework on investments, the CAI deals with the crucial issue of the sustainable development to which Section IV is dedicated. This Section provides, even if through general statements, commitments to promote corporate social responsibility (CSR), improve laws and policies to ensure high levels of environmental protection, enhance green investments. To understand the extent and the implications of the commitments for EU and Italy, the research will investigate in a comparative law perspective how sustainability is shaped in the network of disciplines on investments linking EU and China, and which rule-making measures may better support the effectiveness of provisions on sustainability. The research includes a stage in an enterprise to study the links between investments and CSR regarding the environmental sustainability.
- **Objective of the research project:** a) publish at least 3 articles in scientific journals or book chapters in volumes. At least 2 articles will be published in “Class A” scientific journals (according to ANVUR rating), giving priority to international journals. In the case of a book chapter, the volume must be subjected to peer-review b) presentation of the research results at national and international seminars c) organization of at least one round table with experts from different disciplines and backgrounds to discuss research related topics.
- **Number of hours of frontal teaching per year:** 50
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 58

The specific elements of this procedure are as follows:

- **Department:** Department of Legal Studies - DSG
- **SC:** 12/F1 - CIVIL PROCEDURAL LAW
- **SSD:** IUS/15 - CIVIL PROCEDURAL LAW
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Ambiente e qualità della vita.
- **Areas of development of the project SNSI:** Strumenti per la sicurezza dell'ambiente, monitoraggio. prevenzione e gestione processuale di eventi avversi.
- **PNR topics and articulations:** 5.2.5 Trasformazioni sociali e società dell'inclusione; 5.4.3 Intelligenza artificiale; 5.5.2 Cambiamento climatico, mitigazione e adattamento.
- **Main place of employment:** Bologna
- **Contract type:** full-time
- **Project title:** Profiles of entitlement to bring proceedings in environmental matters (with a focus on class actions).
- **Brief description of the project:** The RTD will have to analyze, from a theoretical and practical point of view, the concept and problems about the entitlement to bring actions in environmental matters. This aspect is of utmost interest of the researcher, in consideration of the difficult qualification of the concept of "environment" and its masterless nature. These peculiarities are reflected in the possibility of taking legal action, causing uncertainties for the injured parties and for the injurers, including companies. Nowadays, the breadth of compensation possibilities finds a further discipline in the "new" law of the class action, applicable to any type of damage including that to the environment. This last aspect, in light of its innovation, will have to be studied in deep by the researcher.
- **Objective of the research project:** The studies conducted by the researcher shall lead to the drafting, within the three-year period, three articles /essays to be published in class A reviews strictly related to topic of the research contract. At the same time, the researcher will have to take part in national and international conferences about topic studied or aspects connected to it. Finally, the researcher will have to offer his/her scientific and didactic contribution in the organization of moots, in order to promote the use of class actions, as a tool for environment protection.
- **Number of hours of frontal teaching per year:** 48
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 59

The specific elements of this procedure are as follows:

- **Department:** Department of Legal Studies - DSG
- **SC:** 12/H3 - PHILOSOPHY OF LAW
- **SSD:** IUS/20 - PHILOSOPHY OF LAW
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area and Areas of development of the project SNSI:** - Salute, alimentazione, qualità della vita - Sviluppo dell'agricoltura di precisione e l'agricoltura del futuro; - Sistemi e tecnologie per il packaging, la conservazione e la tracciabilità e sicurezza delle produzioni alimentari.
- **PNR topics and articulations:** 5.2.5 Trasformazioni sociali e società dell'inclusione - Art.7. Innovazione, democrazia, etica e diritto 5.4.3 Intelligenza artificiale - Art.5. Intelligenza artificiale per l'ambiente e le infrastrutture critiche 5.6.2 Scienze e tecnologie alimentari - Art.1. Sicurezza igienico-sanitaria degli alimenti.
- **Main place of employment:** Ravenna
- **Contract type:** Full-time
- **Project title:** The legal and technical governance of Big Data and Artificial Intelligence in Agrifood: towards a green, sustainable, and innovative transition.
- **Brief description of the project:** The EU Green Deal attempts to conjugate the growing of the EU Single Market with a 'green' and sustainable model. Big Data and Artificial Intelligence can contribute to ease such 'green transition', in particular in agrifood, by planning production processes and energy management, respecting norms and codes of conducts while improving the quality of the products balancing commercial interests and the protection of fundamental rights. The market seems ready to embrace the transformation sustainable agritech, but the EU regulatory framework is fragmented: legislative proposals such as the Data Governance Act or the Artificial Intelligence Act overlap with provisions already in force (Regulation on the Free Flow of Nonpersonal Data), and sectoral food regulation and codes of conduct. We focus the research efforts on the evaluation of the existing norms with the respect to goals set by EU policymakers and on their translation in 'smart & green' design requirements for agrifood operators.
- **Objective of the research project:** The intention is to produce two book chapters on the above issues and an essay in a class A journal. The publications will be aimed at providing theoretical and operational guidelines that companies in the sector will be able to use to achieve the objectives of sustainability and innovation. The six-month experience at a company could be an empirical methodological tool on which to measure the effectiveness of the theories and models formulated by the research.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-12 months period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 60

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 06/A1 - MEDICAL GENETICS
- **SSD**: MED/03 - MEDICAL GENETICS
- **Number of positions:** 1
- **Thematic area:** Innovation
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Biotecnologie, bioinformatica e sviluppo farmaceutico.
- **PNR topics and articulations:** Ambito - Innovazione nella Salute; Articolazioni 4 e 5 - nell'ambito delle Tecnologie Farmaceutiche e Farmacologiche, sia in termini di sviluppo di modelli predittivi innovativi di malattie non trasmissibili, tra cui il cancro, la cui complessità limita il potenziale degli studi su colture cellulari canoniche, sia di analisi delle risposte individuali ai farmaci; Articolazione 1 - nell'ambito delle Biotecnologie applicate all'oncologia; Articolazione 5 - nell'ambito delle Tecnologie per la Salute, con riferimento particolare agli Organ-on-chip. È evidente l'impatto, in coerenza con le aspettative elencate nel documento del PNR sulla Salute, sugli avanzamenti inerenti al superamento dei limiti dei modelli attuali di laboratorio per lo studio ed i test farmacologici predittivi per il carcinoma ovarico. Inoltre, si prevede un forte impatto nell'ambito delle nuove direzioni per la ricerca clinica oncologica in termini di terapia, poiché l'ottimizzazione dei modelli organotipici permetterebbe di evidenziare rapidamente l'efficacia della risposta alle terapie standard. Accanto a questo, lo sviluppo di nuove terapie combinatoriali è un ulteriore outcome atteso del progetto, visto l'evolversi rapido delle nuove terapie antimetaboliche, che hanno il potenziale di essere selezionate in medicina personalizzata sulla base del profilo metabolico del tumore (in coerenza con l'impatto atteso dall'articolazione 4 del settore Tecnologie Farmaceutiche del PNR).
- **Main place of employment:** Bologna
- **Contract type:** Full-time.
- **Project title:** Generation and -omics profiling of organotypic models of ovarian cancer with U-Cup technology to test adjuvant anti metabolic drugs of de novo synthesis.
- **Brief description of the project:** The candidate will be enrolled in a research line on ovarian cancer to implement bioreactor-based technologies with the aim to generate organotypic models that allow to preserve the tumor mass diverse components. Optimization of the model will be carried out in collaboration with the bioreactor producing company. He/She will then characterize such models with -omics techniques (genomics, transcriptomics and metabolomics) in collaboration with a company partner of the research group. Validation of the pharmacological response of the models generated to standard chemotherapy (platinum and taxanes) will be carried out by correlating in vitro tests with clinical outcome, investigating potential chemoresistance mechanisms. In collaboration with a company partner of the research group, he/she will finally test novel anti-mitochondria inhibitors as adjuvant drugs on the organotypic models to set the basis for preclinical trials.
- **Objective of the research project:** The project has the following scientific and productivity macro objectives: - Optimization of the bioreactor technology to generate organotypic models of ovarian cancer; - Models validation through - omics profiling ;- Synthesis/validation of novel anti-metabolic inhibitors The candidate will contribute during the three years to the publication of at least 3 main authorship papers; he/she will take part into the decisional processes for optimization within the companies involved of the technologies and their applications to the experimental models developed. He/she will translate results into preclinics or clinics,

wherever feasible, and disseminate scientific results through participation to national and international conferences (once a year minimum).

- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 61

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 06/M2 - FORENSIC AND OCCUPATIONAL MEDICINE
- **SSD**: MED/44 - OCCUPATIONAL MEDICINE
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Medicina rigenerativa, predittiva e personalizzata**.**
- **PNR topics and articulations:** Grande ambito salute - Articolazione 5: Valutazione dell'impatto dell'ambiente sugli outcomes di patologie acute e cronico-degenerative**.**
- **Main place of employment:** Bologna
- **Contract type:** Full-time.
- **Project title:** Health impact of novel energy production processes.
- **Brief description of the project:** For each traditional and novel technology, including fossil fuels, hydro, nuclear, biofuels, solar, wind, andother technologies, systematic reviews will be conducted on emissions, resulting exposure levels and health effects, both at the workplace and in the general environmental. For each technology, both effects from manufacture and operation will be estimated. Estimated health effects of different technologies will be estimated and compared under different real as well as hypothetical scenarios Health effects will be estimated undermultiple scenarios of exposure and population characteristics Comparisons between technologies will include indicators of uncertainty. Temporal trends in use of technologies and their impact on future health effects will also be considered. To the extent that data allow, the project will have a global scope, including both developed and less-developed countries, with special focus on Italian and European populations.
- **Objective of the research project:** At least 8 peer-reviewed papers in scientific journals, on topics relevant to the project.
- **Number of hours of frontal teaching per year:** 30
- **Admission requirement:** alternatively, High School of Specialization in Biostatistics, High School of Specialization in Public Health or High School of Specialization in Occupational Medicine or equipollent qualifications.
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: English language
- **Research period in a company**: A 6-12 months period of research in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A research period of 6-12 months abroad is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 62

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 05/G1 - PHARMACOLOGY, CLINICAL PHARMACOLOGY AND PHARMACOGNOSY
- **SSD**: BIO/14 – PHARMACOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita**.**
- **Areas of development of the project SNSI:** E-health, diagnostica avanzata, medical devices e mini invasività.
- **PNR topics and articulations:** Ambiti: 1.4 Tecnologie per la salute; Articolazione: 1. Digital health: telemedicina, tecnologie digitali e sensoristica per la medicina preventiva, partecipativa e personalizzata e per l'innovazione dei servizi sanitari e dell'ingegneria clinica.
- **Main place of employment:** Bologna
- **Contract type:** full-time.
- **Project title:** Sustainability of care: towards a more appropriate use of medicines and with a lower impact on the environment.
- **Brief description of the project:** 1- Assessment of the current impact on environment of drug use, by analysing the actual utilisation of medicines in the population at local level and considering the already available classification of risk for the environment of currently marketed medicines by regulatory agencies 2- Map availability of tools for improving the appropriateness of drug use [especially in the cohorts with well-known high drug exposure, e.g., the Elderly], for instance, artificial intelligence algorithms for personalised medicine, software linked to electronic clinical records that alert in case of inappropriate prescriptions, app for digital medicine, opportunity for personalisation of blister by pharmacists 3- Test feasibility and suitability for each healthcare setting (hospital, nursing home, primary care), by taking advantage fron international comparisons 4- Outcome assessment: in terms of both direct impact on environment and indirect.
- **Objective of the research project:** 5 articles in extenso published oninternational peer-reviewed journals, of which 2 with first name, and 2 communications to conferences concerning the topic of this project.
- **Number of hours of frontal teaching per year:** 32
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place**: Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 63

The specific elements of this procedure are as follows:

- **Department:** Department of Veterinary Medical Sciences - DIMEVET
- **SC**: 07/H2 - VETERINARY PATHOLOGY AND INSPECTION OF FOODS OF ANIMAL
- **SSD**: VET/04 - INSPECTION OF FOODS OF ANIMAL ORIGIN
- **Number of positions**: 1
- **Thematic Area:** Green
- **Thematic Area SNSI:** 5.4.3 Salute, alimentazione, qualità della vita
- **Areas of development of the project SNSI:** 5.5.3 Salute, alimentazione, qualità della vita: Traiettorie tecnologiche di sviluppo a priorità nazionale.
- **PNR topics and articulations:** 1) 5.1.4 Tecnologie per la salute: Articolazione 10. Bioinformatica; 2) 5.6.2 Scienze e tecnologie alimentari: Articolazione 3. Valorizzazione del microbioma nei sistemi produttivi agroalimentari; 3) 5.6.4 Conoscenza e gestione sostenibile dei sistemi agricoli e forestali: Articolazione 2. Sicurezza e qualità delle produzioni primarie.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Application of high throughput sequencing as holistic warning system to identify sources and transmission routes of known and emerging zoonotic agents and antibiotic resistance in food systems: case study on the poultry food chain.
- **Brief description of the project:** Two poultry farms using and not using antibiotics during the rearing cycle will be identified. In each of them 3 longitudinal samplings will be performed to collect faeces, litter, air, drinking water and feed (in the farm); caeca contents and carcasses (in the slaughterhouse). All samples will be submitted to shotgun metagenomic sequencing (month 1-8). Each metagenome will be processed with bioinformatic and biostatistics pipelines to characterize taxonomic composition and antibiotic resistant genes (GAR) (months 9-36) to map all microbiomes and corresponding drivers to be enhanced to anticipate and mitigate the spreading of pathogenic agents and GAR. The expected impacts are: (1) the implementation of farming strategies more sustainable from an environmental point of view due to the reduced use of antimicrobials and low mortality rate; (2) the valorisation of metagenomics as high throughput methodology for data collection to predict and avoid the emergence of new pandemic.
- **Objective of the research project:** During the three years the researcher will: - publish at least 6 papers in peer reviewed international journals listed in WOS o SCOPUS and participate as speaker in at least 2 national or international congresses presenting the results related to the specific objectives described in the project; - produce a webinar in Italian and English on the application of shotgun metagenomics as warning system for known and emerging zoonotic agents as well as antibiotic resistance determinants; - provide 4 hours training to the poultry company on the project results and their impacts for the poultry sector.
- **Number of hours of frontal teaching per year:** 30
- **Admission requirement:** Phd
- **Maximum number of publications:** 20
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6 months in a company is scheduled, the company will be identified by the Department.
- **Research period abroad**: A research period abroad of 6 months is scheduled, the host foreign structure will be identified by the Department.

ATTACHMENT 64

The specific elements of this procedure are as follows:

- **Department:** Department of Veterinary Medical Sciences - DIMEVET and Department for Life Quality Studies - QUVI
- **SC**: 07/H4 - VETERINARY CLINICAL MEDICINE AND VETERINARY PHARMACOLOGY
- **SSD**: VET/08 - VETERINARY CLINICAL MEDICINE
- **Number of positions**: 2
- **Thematic Area:** Green
- **Contract-type:** Full-time
- **Admission requirement:** Phd
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: Both researchers will have to carry out a research period of 6 months in a company. The companies will be identified by the Departments.
- **Description of the projects and their specific elements**:
  1) **Project 1**: Department of Veterinary Medical Sciences - DIMEVET – **project title:** Sustainable pet food through the use of novel foods in veterinary diets for the management of internal diseases in dogs and cats.
     Brief description of the project: The junior researcher will actively collaborate with the animal feed company to identify novel foods (plant-derived products, algae, microorganisms or insects) as possible sources for Pet food and dietary supplement production, and to define nutritional protocols aimed at the management of the main diseases of dogs and cats that already benefit from veterinary diets on the basis of scientific literature (gastrointestinal, renal, urological, hepatic diseases, allergic dermatopathies, oncological diseases). Subsequently, the junior researcher will be involved in the evaluation of the safety and efficacy of these diets through the definition of clinical trials involving the enrolment of patients with spontaneous pathologies who will be examined at the DIMEVET University Veterinary Hospital. The results of the dietary protocols will be evaluated through the analysis of clinical, clinicopathological and toxicological scores, as well as through owner acceptability scores.
     Objective of the research project: 2 scientific papers presented at national or international congresses and 2 scientific publications presented in national or international peer-reviewed journals.
     Main place of employment: Bologna
     Number of hours of frontal teaching per year: 25
     Thematic Area SNSI: 5.4.3 Salute, alimentazione, qualità della vita
     Areas of development of the project SNSI: 5.5.3 Salute, alimentazione, qualità della vita: Traiettorie tecnologiche di sviluppo a priorità nazionale.
     PNR topics and articulations: 5.5.2 Cambiamento climatico, mitigazione e adattamento: Articolazione 6. Valutazione della efficacia e della sostenibilità delle misure di mitigazione; 2) 5.6.2 Scienze e tecnologie alimentari: Articolazione 5. Fonti proteiche e loro utilizzo nelle tecnologie alimentari; 3) 5.6.4 Conoscenza e gestione sostenibile dei sistemi agricoli e forestali: Articolazione 2. Sicurezza e qualità delle produzioni primarie.
  2) **Project 2**: Department for Life Quality Studies - QUVI – **project title:** Integrated protocol to measure, with a unique index, the sustainability of cattle farms through animal welfare assessment and Life Cycle Assessment - LCA (Integrated Animal Welfare & LCA - IAW&LCA index).

Brief description of the project: The sustainability of livestock farming is debated from the point of view of both animal welfare and environmental impact (climate-impact green-house gasses emissions and water footprint). Strategies to reduce the environmental impact of livestock production (intensification of production, increased stocking density, reduced longevity of animals, massive use of drugs) are often in conflict with animal welfare. Aim of the research is to develop an integrated protocol to obtain a single parameter for assessing the sustainability of livestock farms taking into accountthe level of animal welfare, as assessed by the Classyfarm protocol, and the environmental impact of the farm, expressed as a unit in kg CO2-eq through LCA. The protocol will be tested on cattle farms, revised and, finally, validated on another farms. The results will be correlated with farm productivity and drug consumption. The project is part of the green transition of the livestock sector.
Objective of the research project: 1) report with: the checklists for the collection of the data required for the LCA and for the assessment of animal welfare; algorithms for obtaining the IAW&LCA index; 2) 2 publications in open access journals; 3) papers on national journals and dissemination events; 4) creation of the IT support for collection and storage of farm data and for their processing; 5) creation of an app to monitor farm sustainability.
Main place of employment: Rimini
Number of hours of frontal teaching per year: 0
Thematic Area SNSI: Health, Food and Quality of life.
Areas of development of the project SNSI: Precision agriculture development and the agriculture of the future.
PNR topics and articulations: 5.6.4 - Knowledge and sustainable management of agricultural and forestry systems (article 1 - Sustainable improvement of primary productions; article 4 - Agricultural and forestry activities for the protection of the environment and natural resources).

ATTACHMENT 65

The specific elements of this procedure are as follows:

- **Department:** Department of Veterinary Medical Sciences - DIMEVET
- **SC**: 07/H5 - VETERINARY CLINICAL SURGERY AND VETERINARY OBSTETRICS
- **SSD:** VET/10 - VETERINARY CLINICAL OBSTETRICS AND GYNECOLOGY
- **Number of positions:** 1
- **Thematic Area:** Green
- **Thematic Area SNSI:** 5.4.3 Salute, alimentazione, qualità della vita
- **Areas of development of the project SNSI:** 5.5.3 Salute, alimentazione, qualità della vita: Traiettorie tecnologiche di sviluppo a priorità nazionale.
- **PNR topics and articulations:** 1) 5.5.1 Salute: Articolazione 2. Patogenesi, diagnosi, sorveglianza e terapia delle infezioni, comprese le infezioni emergenti; 2) 5.1.2 Tecnologie farmaceutiche e farmacologiche: Articolazione 3. Ricerca di nuove molecole attive su agenti infettivi e sviluppo di anticorpi monoclonali e vaccini; 3) 5.1.3 Biotecnologie: Articolazione 4. Interazioni microrganismi-ospite nella salute e nelle malattie umane e animali.
- **Main place of employment:** Bologna
- **Contract-type:** Full-time
- **Project title:** Reduction of antibiotic administration in equine sepsis through the application of innovative cell therapies.
- **Brief description of the project:** The objective of the project is to reduce the use of antibiotics in the septic horse and consequently environmental pollution and antibiotic resistance, developing a therapy based on the principles of regenerative and restorative medicine. Specific objectives: Study of cytokines expression in plasma and mesenchymal cells deriving from fetal adnexa and cord blood of healthy and septic horses; Study of the stimulation of equine mesenchymal cells and endogenous precursors with pharmacological agents and pulsed electromagnetic fields, to increase the expression/release of anti-inflammatory cytokines and growth factors; Study of the efficacy of cellular therapies in septic foals and adult horses through the stimulation of self-repair (prospective trial); Collection of cells, biological fluids and tissues from spontaneous equine sepsis (DIMEVET biobank); Monitoring of antibiotic resistance in the equine population under study, subdivided into prospective cohorts.
- **Objective of the research project:** The project will lead to the publication of at least 5 scientific papers in international journals. Furthermore, it aims to enhance the human capital in terms of scientific, social and economic repercussions on the national territory, thanks to the collaboration with local companies and exchange between the world of research and the world of production.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** Phd
- **Maximum number of publications:** 15
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A research period of 6-12 months in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 66

The specific elements of this procedure are as follows:

- **Department:** Department for Life Quality Studies - QUVI
- **SC:** 05/A1 – BOTANY
- **SSD:** BIO/15 - PHARMACEUTICAL BIOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI**: Health, nutrition, quality of life.
- **Areas of development of the project SNSI:** Nutraceuticals, Nutragenomics, Functional Food.
- **PNR topics and articulations:** "Bioindustry for the Bioeconomy", section: Recovery and valorisation of waste and organic products at the end of life, for the regeneration of soils and protection of the environment".
- **Main place of employment:** Rimini
- **Contract type:** full-time
- **Project title:** Use of biostimulants obtained from agro-industrial by-products as a strategy to reduce the impact of climate changes on food plants.
- **Brief description of the project:** The project will be divided into the following phases: 1) study of the response of model plants to abiotic stress conditions through measurements of growth, photosynthetic capacity, biomass production, biochemical and morphological parameters associated with stress, evaluation of the phytochemical profile of the edible product: 2) preparation of extracts/fractions starting from byproducts of agro-industrial processes through a "nature-based" approach through the use of GRAS solvents with low environmental impact for a full valorisation of by-products. This will be followed by the evaluation of the potential biostimulant activity of the extracts and / or fractions obtained on plants under study, especially in relation to their ability to modulate their response to abiotic stress conditions; 3) analysis of the metabolic profile of control vs biostimulant-treated plants to evaluate their nutraceutical potential through a "green chemistry" approach.
- **Objective of the research project:** The outcome of the project could have practical application. The extracts with a biostimulant activity in laboratory-scale experiments could be tested under field conditions on various plant species in view of a sustainable management of farms. The results of the experimentation will be the subject of 3 publications in scientific international journals and articles in national journals. The project is in line with the topic of the National Program for Research 2021-2027 "Bioindustry for the Bioeconomy", section: Recovery and valorization of waste and organic products at the end of life, for the regeneration of soils and protection of the environment". The model plants will be chosen based on their importance as food plants and as sources of health-promoting functional foods, in line with the thematic area "Health, nutrition, quality of life", developmental trajectory Nutraceuticals, Nutragenomics, Functional Food of the National Strategy for Intelligent Specialization.
- **Number of hours of frontal teaching per year:** 0
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 67

The specific elements of this procedure are as follows:

- **Department:** Department of Political and Social Science - SPS
- **SC:** 14/A2 - POLITICAL SCIENCE
- **SSD:** SPS/04 - POLITICAL SCIENCE
- **Number of positions:** 1
- **Thematic area:** Innovation
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente; Agenda Digitale, Smart Communities, Sistemi di mobilità intelligente.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale; Sistemi per la sicurezza dell'ambiente urbano, il monitoraggio ambientale e la prevenzione di eventi critici o di rischio.
- **PNR topics and articulations:** Ambito 5.3 SICUREZZA PER I SISTEMI SOCIALI - 5.3.3 Cybersecurity; Articolazioni: 2. Sicurezza dei sistemi ciberfisici e delle infrastrutture; 4. Sicurezza dei servizi al cittadino e alle imprese; 5. Ecosistema della cybersecurity; 6. Infrastrutture di ricerca per la cybersecurity.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Cybersecurity governance.
- **Brief description of the project:** Digital innovation affects every corner of economic, social and political life, with issues related to the security of computer networks and data. The research project will focus the role of the private sector in the cybersecurity governance, both domestically as well as internationally. The winner will focus on three research themes, namely (1) the nexus between security and diplomacy in the digital era, (2) the relationship between public and private actors in cybersecurity, with particular emphasis on the plurality of international stakeholders and (3) the specific role of cyber-diplomacy to increase the security of cyberspace. For such goals, the winner will undertake a multidisciplinary research combining theoretical and empirical analysis (e.g. interviews with companies and institutions, data collection from multiple sources). The main benefit for the private sector would be that of making available 'in-house' skilled professionals who may help companies to improve their cybersecurity standing.
- **Objective of the research project:** Scientific productivity goals for the Research Fellow (RTDa) will include the publication, over the 3-year period, of three (possibly four) papers for peer-review journals (class A or equivalent), predominantly on the following topics: (a) Italy's role in the international cybersecurity governance; (b) the public-private cooperation on domestic and international cybersecurity; (c) the development for the private sector of a proper 'cyber-diplomacy' structure, which is required internationally for a more efficient management of cyberspace. Other goals will also include participation in at least four national or international conferences and/or seminars, which will be required for the dissemination of results as well as to identify policy proposal and actions that would be necessary to support Italy's digital transformation.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 68

The specific elements of this procedure are as follows:

- **Department:** Department of Political and Social Science - SPS
- **SC:** 14/C1 – GENERAL SOCIOLOGY
- **SSD:** SPS/07 - GENERAL SOCIOLOGY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Salute, alimentazione, qualità della vita; Industria intelligente e sostenibile, energia e ambiente.
- **Areas of development of the project SNSI:** Sistemi per la sicurezza dell'ambiente urbano, il monitoraggio ambientale e la prevenzione di eventi critici o di rischio; Sistemi e tecnologie per il water e il waste treatment.
- **PNR topics and articulations:** Ambito 5.2 CULTURA UMANISTICA, CREATIVITÀ, TRASFORMAZIONI SOCIALI, SOCIETÀ DELL'INCLUSIONE - 5.2.5 Trasformazioni sociali e società dell'inclusione – Articolazioni: 5. Benessere psico-sociale e qualità della vita; 6. Welfare urbano, città pubblica e diritti; 9. Trasformazioni tecnologiche e Design centrato sulla persona; 12. Strategie e strumenti per la rigenerazione urbana e per il governo del territorio.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Cultures and Sustainability Practices in the Ecological Transition - Citizens' Agency and Models of Territorial Governance in Waste Management: A Comparative Analysis of Accountability Tools and Processes in Italian Metropolitan Areas.
- **Brief description of the project:** As regards waste cycles, the project includes the following actions: analysis of legislation; literature review; research and data analysis on waste production and recycling in Italy; mapping of management models and best practices. Empirical activities include: identification of case studies based on waste collection, management and disposal models; interviews with key informants to identify local governance models and critical elements; survey identifying - with a particular focus on separate waste collection - determining factors associated with Italian citizens' practices and cultures of environmental sustainability (questionnaire development, pre-testing, sampling); interviews with citizens to explore meanings attached waste recycling and reasons that (dis)incentivize it; identification of actions promoting citizen and local community participation in the ecological transition.
- **Objective of the research project:** Scientific productivity goals are the production, during the 3-year period, of at least three publications (articles in journals, book chapters, books) regarding the following topics: relevance of waste recycling (separate collection) in Italy for sustainable economic development; practices and management models of environmental sustainability on the Italian territory, with particular attention to waste recycling; citizens' viewpoints: territory-specific approaches and cultures towards environmental sustainability. The goals also include active participation in national or international conferences and seminars, as well as initiatives for the dissemination of results will be promoted, involving stakeholders of the investigated territories, in order to identify proposals for policies and actions aimed at a full ecological transition.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 69

The specific elements of this procedure are as follows:

- **Department:** Department of Political and Social Science - SPS
- **SC:** 14/B2 - HISTORY OF INTERNATIONAL RELATIONS AND OF NON-EUROPEAN SOCIETIES AND INSTITUTIONS
- **SSD:** SPS/14 - ASIAN HISTORY AND INSTITUTIONS
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic Area SNSI:** Industria intelligente e sostenibile, energia e ambiente; Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Processi produttivi innovativi ad alta efficienza e per la sostenibilità industriale; Sistemi per la sicurezza dell'ambiente urbano, il monitoraggio ambientale e la prevenzione di eventi critici o di rischio.
- **PNR topics and articulations:** Ambito 5.2 CULTURA UMANISTICA, CREATIVITÀ, TRASFORMAZIONI SOCIALI, SOCIETÀ DELL'INCLUSIONE - 5.2.5 Trasformazioni sociali e società dell'inclusione; Articolazioni: 2. Mobilità e migrazioni; 3. Disuguaglianze e inclusione; 7. Innovazione, democrazia, etica e diritto; 8. Modelli di sviluppo, competenze e formazione.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** A Green Recovery For All: Patterns, Challenges and Opportunities in MENA. The research analyses the elaboration of environmental topics in the Middle East and North Africa by social, political and economic forces.
- **Brief description of the project:** Filling the gap in current literature on the relationship between environment and politics in the Arab countries of the Middle East and North Africa, and to support the strategic planning of sectoral enterprises and NGOs working in the area, the research project will analyze, on a comparative perspective, the projects and programmes for a "green transition" elaborated by social, economic and political forces. Local green initiatives will be then analyzed on the background of regional and international ones, including the European policies in the Mediterranean space. Specific issues under scrutiny will concern the connections with the governance over natural resources, water, food security and migrations. A 60-hours teaching for each academic year on the research topics, mainly in Bologna, as well as a 6-month collaboration with private enterprises are also included within the programme.
- **Objective of the research project:** During the 3-year period, the research project will deliver the following results: literature review; ground-research for data and source collection; three publications at least (journal articles chapters in volumes, books) on the topics of the research programme with scientifically renowned editors. Active participation to workshops and conferences, at national and international levels are highly suggested; ground research in the area and collaboration with MENA partners are also highly welcomed, health and security conditions permitting.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of 6 months of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 70

The specific elements of this procedure are as follows:

- **Department:** Department of Sociology and Business Law - SDE
- **SC:** 12/E3 - ECONOMICS, FINANCIAL AND AGRI-FOOD MARKETS LAW AND REGULATION, NAVIGATION AND AIR LAW
- SSD: IUS/03 - AGRI-FOOD LAW
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI:** Salute, alimentazione, qualità della vita.
- **Areas of development of the project SNSI:** Sistemi e tecnologie per il packaging, la conservazione e la tracciabilità e sicurezza delle produzioni alimentari.
- **PNR topics and articulations:** PRODOTTI ALIMENTARI, BIOECONOMIA, RISORSE NATURALI, AGRICOLTURA, AMBIENTE - Articolazione: Green Technologies.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** New legal models of food consumption and environmental sustainability along the lines of the "Farm to fork" Strategy**.**
- **Brief description of the project:** The research moves along the track of the European Strategy "From producer to consumer" on food sustainability and aims to contribute to the overall objective of improving the link between healthy people, healthy societies and a healthy planet, through the implementation of sustainable food systems, compatible with the conservation of the ecosystem, food biodiversity and with a reduced impact on climate change. The pandemic from Covid-19 has also made necessary a rethinking of the legal rules and production schemes precisely in terms of sustainability, reduction of waste, reuse of non-renewable resources in line with the parameters of the circular economy and bioeconomy. Research will focus on the new role of food labelling in the agri-food production system as a tool for business to provide consumers with clear information, including new technologies, to facilitate the choice of healthy, sustainable and responsible diets.
- **Objective of the research project:** Publication of n.1 Book chapter or an article in scientific Journals Publication of at least n. 2 articles in sector's Class A (by Anvur rating) Journals Participation in national and international conferences and congresses with communications relevant to the research project.
- **Number of hours of frontal teaching per year:** 40
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 6-month period of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 71

The specific elements of this procedure are as follows:

- **Department:** Department of History and Cultures - DiSCi
- **SC:** 10/D1 - ANCIENT HISTORY
- **SSD:** L-ANT/03 ROMAN HISTORY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI**: 5.3.13 Tecnologie per il Patrimonio Culturale; 5.4.5 Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI**: 5.5.5 Turismo, patrimonio culturale e industria della creatività: Traiettorie tecnologiche di sviluppo a priorità nazionale.
- **PNR topics and articulations**: 5.2. Cultura umanistica, creatività, trasformazioni sociali, società dell'inclusione - 5.2.1 Patrimonio culturale - Articolazione 4. Applicazione di nuovi modelli economici per la sostenibilità e la resilienza, Impatto atteso: supporto scientifico a politiche di sostenibilità e resilienza nella fruizione del patrimonio culturale; 5.2.2 Discipline storico, letterarie e artistiche - Articolazione 3. Discipline umanistiche, ambiente e sostenibilità, Impatto atteso: supporto scientifico a politiche di sostenibilità capaci di comprendere e valorizzare le dinamiche inter e transculturali, attraverso il caso di studio dell'area culturale adriatica; 5.2.3 Antichistica - Articolazione 3. Paesaggi culturali: alle origini delle tradizioni, Impatto atteso: contributo alla valorizzazione e alla fruizione del patrimonio culturale.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Green Paths on the shores of the Adraitic Sea: enhancement of the Roman historical heritage.
- **Brief description of the project:** The RTD will valorize the data related to the Roman period in the context of the environmental tourist use of the Adriatic landscape, as intangible cultural heritage. This valorization will start from the data already present in the IT Atlas of the Ancient Adriatic and will take the form of the creation of eco-compatible itineraries along the routes already travelled in Antiquity, taking into account the current needs of environmental, social and economic sustainability of the local communities involved. In this way, the aim is to create a multilingual and interdisciplinary profile that, while anchored in the humanities, dialogues with the various operators in the sector of protection and tourist enhancement of the cultural heritage. It is therefore essential that part of the research is carried out in the company, both for the implementation of solutions for the use of cultural heritage and for the analysis of market trends and the effectiveness of the proposals.
- **Objective of the research project:** In the three years the researcher will publish at least 6 articles (3 of which published in A-ranked Journals) or 1 volume and 2 contributes (1 of which published in A-ranked Journals). 2 articles will relate to eco-compatible itineraries.
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A period of 6-12 months of research in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 72

The specific elements of this procedure are as follows:

- **Department:** Department of History and Cultures - DiSCi
- **SC:** 10/A1 - ARCHAEOLOGY
- **SSD:** L-ANT/10 - METHODS OF ARCHAEOLOGICAL RESEARCH
- **Number of positions:** 1
- **Thematic area:** Innovation
- **Thematic Area SNSI:** Turismo, patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI:** Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici; Riduzione dell'impatto ambientale (green engine).
- **PNR topics and articulations:** 5.2.1 Patrimonio culturale; 5.2.3 Antichistica; 5.2.5 Trasformazioni sociali e società dell'inclusione.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Digital Archaeology.
- **Brief description of the project:** The Junior Professor will develop independent projects particularly focused on digital documentation and analysis methods (i.e., digital methodologies for the investigation and the analysis of archaeological contexts; how new technologies are influencing the way of how we investigate and perceive the past). Her/his research may also extend to the role which digital and geospatial technologies (i.e. remote sensing, 3D mapping, GIS) play in the investigation and protection of sites and materials of cultural significance as well as developing public-facing approaches that alter the traditional processes of production and propagation of knowledge in historic parks, archaeological sites and museums (e.g., digital archives and collections, virtual and augmented reality, mobile apps). The researcher will also take charge of quantitative analytics and data interpretation. A period totaling 12 months in a private company will be devoted to developing digital products in the above mentioned themes.
- **Objective of the research project:** In the three years the researcher will publish at least 6 contributes (3 of which published in A-ranked Journals) or 1 volume and 2 contributes (1 of which published in A-ranked Journals).
- **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 with verification of the adequate knowledge of the English language.
- **Research period in a company**: A 12-month period in a company is scheduled, the company will be identified by the Department.

ATTACHMENT 73

The specific elements of this procedure are as follows:

- **Department:** Department of History and Cultures - DiSCi
- **SC:** 11/B1 - GEOGRAPHY
- **SSD**: M-GGR/01 - GEOGRAPHY
- **Number of positions:** 1
- **Thematic area:** Green
- **Thematic area SNSI**: Turismo, Patrimonio culturale e industria della creatività.
- **Areas of development of the project SNSI**: Tecnologie e applicazioni per la conservazione, gestione e valorizzazione dei beni culturali, artistici e paesaggistici; Riduzione dell'impatto ambientale (green engine).
- **PNR topics and articulations**: 5.5.1 Mobilità sostenibile; 5.5.2 Cambiamento climatico, mitigazione e adattamento; 5.2.5 Trasformazioni sociali e società dell'inclusione.
- **Main place of employment:** Bologna
- **Contract type:** Full-time
- **Project title:** Environmental Humanities.
- **Brief description of the project:** The researcher will perform research and teaching within the area of the SC and SSD. More specifically, his research will focus on the Environmental Humanities, a transdisciplinary field that has been for some time at the core of relevant international academic debates, with the contribution the discipline of historical and cultural geography, environmental history, environmental philosophy and critical literature. The appointed researcher will explore and develop a critical approach to the representations of Nature and the environment - and the related practices - that will take into account the Italian cultural and social context and tradition in order to facilitate a productive dialogue between Humanities and Earth Sciences and Life Sciences, and to contribute to the solution of environmental problems related to the private sector by providing innovative forms of critical knowledge of our 'cultural' understanding of the environment and of its management.
- **Objective of the research project:** In the three years the researcher will publish at least 6 articles in A ranked Journals.
- **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:** Language chosen by the candidate between Italian and English. Candidates choosing Italian, will also have to demonstrate the adequate knowledge of the English language.
- **Research period in a company**: A period of 6-12 months of research in a company is scheduled, the company will be identified by the Department.