



**UNIVERSITÀ  
DEGLI STUDI  
DI BERGAMO**

Direzione personale  
logistica  
e approvvigionamenti

Gestione risorse umane  
Gestione giuridica  
e selezioni assegni di ricerca

**PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE  
AWARDING OF NO. 6 EARLY STAGE GRANTS FOR CONDUCTING RESEARCH  
PURSUANT TO ART. 22 OF LAW NO. 240/2010 AT THE DEPARTMENTS OF  
UNIVERSITY OF BERGAMO - TYPE B  
PICA CODE: 21AR012**

**THE CHANCELLOR**

GIVEN Law No. 168 of 9 May 1989;  
GIVEN Law No. 240 of 30 December 2010, and following amendments and integrations and, in particular, Art. 22 on research grants;  
GIVEN the Statute of the University of Bergamo enacted with Chancellor's Decree Index No. 92/2012 of 16 February 2012;  
GIVEN the University's current Regulations for awarding grants for conducting research enacted with Chancellor's Decree Index No. 157/2018 of 26 February 2018, modified by Chancellor's Decree Index No. 376/2020 of 17<sup>th</sup> of August 2020 in force as of 1<sup>st</sup> September 2020;  
GIVEN Ministerial Decree Prot. No. 102 of 09 March 2011, recorded at the Court of Auditors on 13 May 2011, which revalued the minimum gross annual amount of grants for conducting research;  
GIVEN Decree-Law No. 192 of 31 December 2014, converted, with amendments, by Law No. 11 of 27 February 2015 and, in particular, Art. 6 paragraph 2 bis which extended by two years the total duration of grants established under Art. 22 of Law No. 240/2010, taking it from four to six years;

Referring also to:

- the University's Code of Ethics issued with Chancellor's Decree. Prot. No. 14405/I/003 of 19.7.2011 and amended with Chancellor's Decree. Rep. No. 262/2018, Prot. No. 60030/I/003 of 12.4.2018;
- the University's Regulations on research integrity and ethics, enacted with Chancellor's Decree Index No. 387/2016 of 18 July 2016;

ACQUIRED the resolutions of the Councils of the Structures involved which approved the research projects and resolved on the requirements for candidates' admission to the selection;

ASCERTAINED the financial backing (tab. 1);

**DECREES**

**Article 1  
Call for public selection**

6 public selections are launched based on qualifications and interview for the awarding of No. 6 grants for conducting research pursuant to Art. 22 of L. No. 240/2010 with a contract under private law at the research structures of the University of Bergamo as indicated hereafter:

COD E	TYP E	DEPARTMENT	ANNUAL GROSS AND FUNDS	DURATI ON	TITLE	A.R.F.	A.D.	TUTOR
1	B	Engineering and applied sciences (deliberation 21.7.2021)	€ 20.340,00 Research project "PONTI_WP2-3-4 - Accordo RELUIS-DISA prot. 59 del 23/06/2021" Responsabile scientifico Prof. Paolo Riva RELUISPONTIPR21 CUP: F55F21000960001	12 months	<i>Application of Existing Bridge Italian Guidelines</i>	08/B3 Structural engineering	ICAR/09 Structural engineering	Prof. Paolo RIVA



<b>2</b>	B	Engineering and applied sciences (deliberation 21.7.2021)	€ 25.000,00 Research project PON "Ricerca e Innovazione" 2014 - 2020 E FSC Progetto cod. ARS01_00333 Titolo "Tecnologie innovative per il controllo, il monitoraggio e la sicurezza in mare - TETI" Responsabile scientifico Giuseppe Rosace CUP B55F21000250005 codice progetto TETIDISAROSAC21	24 months	<i>Development of sensors for control, monitoring and safety at sea</i>	03/B2 Principles of chemistry for applied technologies	CHIM/07 Principles of chemistry for applied technologies	Prof. Giuseppe ROSACE
<b>3</b>	B	Engineering and applied sciences (deliberation 21.7.2021)	€ 25.000,00 Research project PON "Ricerca e Innovazione" 2014 - 2020 E FSC Progetto cod. ARS01_00333 Titolo "Tecnologie innovative per il controllo, il monitoraggio e la sicurezza in mare - TETI" Responsabile scientifico Giuseppe Rosace CUP B55F21000250005 codice progetto TETIDISAROSAC21	24 months	<i>Development of sensors for control, monitoring and safety at sea</i>	03/B2 Principles of chemistry for applied technologies	CHIM/07 Principles of chemistry for applied technologies	Prof. Giuseppe ROSACE
<b>4</b>	B	Management, information and production engineering (deliberation 19.7.2021)	€ 19.367,00 Research project "Workload-reduction machine vision-based Technology Hub for MANufacturing - WATCHMAN" - "POR FESR 2014-2020 - Call HUB Ricerca e Innovazione" - Responsabile scientifico Fabio Previdi codice WATCHMANPREV18 CUP E11B20000010007	12 months	<i>Use of innovative sensors to measure health parameters of an operator during work activities with a collaborative robot</i>	09/A3 Industrial design, machine construction and metallurgy	ING-IND/15 Design methods for industrial engineering	Prof. Andrea VITALI
<b>5</b>	B	Management, information and production engineering (deliberation 19.7.2021)	€ 20.000,00 Research project "Modelli per la generazione distribuita di energia elettrica con impianti a fonti rinnovabili e batterie di stoccaggio" Responsabile scientifico Prof.ssa Maria Teresa Vespucci codice VESPENERGI15	12 months	<i>Development of mathematical models for simulating the coupling of the electric system with the gas system for the long-term decarbonization of the national energy system</i>	01/A6 Operations research	MAT/09 Operations research	Prof.ssa Maria Teresa VESPUCCI
<b>6</b>	B	LAW (deliberation 28.7.2021)	€ 20.352,00 Research project PRIN 2017 dal titolo "La certezza del diritto dal mondo antico alla discussione moderna - prot. 20177PXSMA_003" Responsabile scientifico Prof. Antonio Banfi PRIN17DGIUBANF@ - CUP: F54I190000960001	24 months	<i>Predictive justice and legal certainty</i>	12/A1 Private law	IUS/01 Private law	Prof. Roberto PUCCELLA

Each grant is paid to the contract holder in monthly instalments of equal amount.  
The research projects are described in Annex A of this call constituting an integral part hereof.



## **Article 2 Requirements for admission to the selection**

The selection procedure is open to **scholars in possession of a professional scientific curriculum suitable for conducting the scientific research provided for by this call, as well as of the following requirements:**

- **2<sup>nd</sup> cycle degree: Diploma di Laurea Specialistica (LS) or Laurea Magistrale (LM)** and equivalent qualifications, **or Diploma di Laurea (DL)** obtained according to the procedures preceding the entry into force of Ministerial Decree 509/1999 and following amendments and integrations and equivalent qualifications for admission to public competitions (**see the following table**).

To establish the equivalence among **Diploma di Laurea (DL)** and **Diploma di Laurea Specialistica (LS) or Laurea Magistrale (LM)**, it is possible to refer to the following link: <http://attiministeriali.miur.it/UserFiles/3160.pdf>

The Decrees that govern the equivalence among Italian academic qualifications for participating in public competitions are available at the following link: <http://hubmiur.pubblica.istruzione.it/web/universita/equipollenze-titoli>

### **The qualifications obtained abroad must be recognised as valid in the Italian territory.**

As regards qualifications obtained abroad that have not already been recognised in Italy with formal procedure pursuant to the applicable laws, the Commission is competent to assess the equivalence – as to the nature, level and subject correspondence (degree cycle or CUN Area for PhD qualifications) – to the qualifications required by this call, for the sole purposes of admission to the present selection. As regards qualifications obtained abroad, required by the call for the purpose of admission to this selection, the applicant is required as follows:

- in the event of qualifications already recognised as valid in the Italian territory, to indicate in the application the details of the provision attesting the occurred recognition pursuant to the applicable laws;
- in the event of qualifications not yet recognised, **to annex to the application a certified copy of the statement of qualification equivalence**, issued by the competent Italian diplomatic and consular authorities abroad, and the certificate of the exams taken or the supplement degree.

In order to ensure the widest participation in the selection, the applicant who is not in possession of the above documentation can annex a copy of the qualification with a translation into Italian or English; the candidate will have to submit the above documents within the terms peremptorily established by the Office under penalty of exclusion.

In the event of qualifications not yet recognised, the candidate is admitted if selected and, if winner, prior to signing the contract, must submit the documents requested by the office within the terms peremptorily established.

- **knowledge of one or more foreign languages (see the following table); the knowledge of the Italian language shall be evaluated for foreign candidates.**

Moreover, the applicant is also required:

- **to be at least 18 years old;**
- **to be in possession of civil and political rights;**
- **to have no criminal convictions or ongoing criminal proceedings that would prevent, in accordance with the regulations in force, the establishment of an employment relationship.**



CODE	SPECIFIC REQUIREMENTS	LANGUAGE
<b>1</b>	Diploma di Laurea Specialistica o Magistrale (ed equiparati) in Civil engineering (classes 28/S or LM-23) or Building systems engineering (class LM-24)	English
<b>2</b>	Diploma di Laurea Specialistica o Magistrale (ed equiparati) in Chemical sciences (classes 62/S or LM-54)	English
<b>3</b>	Diploma di Laurea Specialistica o Magistrale (ed equiparati) in Chemical sciences (classes 62/S or LM-54)	English
<b>4</b>	Diploma di Laurea Specialistica o Magistrale (ed equiparati) in Management Engineering (classes 34/S or LM-31)	English
<b>5</b>	Diploma di Laurea Specialistica o Magistrale (ed equiparati) in Management Engineering (classes 34/S or LM-31)	English
<b>6</b>	Diploma di Laurea Specialistica o Magistrale (ed equiparati) in Law (classes 22/S or LMG-01)	English

The selective procedure does not allow admittance to:

- those who have a degree of kinship or affinity, up to and including the fourth degree, with a professor from the relevant structure, or with the Chancellor, the General Manager or a member of the University's Board of Directors;
- those who have been holders, including any renewals, of research grants awarded pursuant to Art. 22 of Law No. 240/2010 for a period which, added to the duration of the contract provided for by this call, exceeds a total of six years, except for the period in which the grant was used in coincidence with the PhD within the maximum legal duration of the relevant course;
- those who were contracted as research fellow or fixed-term researcher as per ss. 22 and 24 of Law 240/2010 at the University of Bergamo or other Italian public, private or online Athenaeums, as well as any other Body indicated in para 1 of s. 22 of Law 240/2010 for a length of time which, if summed to the duration of the contract in this announcement, exceeds 12 years in total, albeit not consecutive; periods of time spent on maternity or sick leaves do not count to the purpose of the duration of the aforementioned relationships, in accordance with current Laws;

The applicant enrolled in a Diploma di Laurea (DL), Diploma di Laurea Specialistica (LS), Laurea Magistrale (LM), PhD with study grant or medical specialisation in Italy or abroad can participate in the selection object hereof; should the applicant be the winner, the research grant will be awarded subject to withdrawal from studies or PhD study grant.

Pursuant to art. 22 paragraph 2 of Law 240/2010 can not be recipient of the grants the regular personnel at universities, institutions and public entities of research and experimentation, the Italian National Agency for new technologies, energy and sustainable economic development (ENEA) and the Italian Space Agency (ASI) and institutions whose scientific specialization diploma was recognised equivalent to a PhD pursuant to the fourth paragraph under article 74 of Presidential Decree of 11 July 1980, No. 382.

The holder of the grant can attend PhD courses whose subjects are related to the research activities connected with the grant, upon prior evaluation of the Structure of reference. However, the research grant is incompatible with the enjoyment of the PhD study grant.

The applicant not in possession of Italian citizenship and admitted to the competition in accordance with what indicated above must also meet the following requirements:

- a) possess civil and political rights also in the Countries of belonging or of provenance;
- b) be in possession, except for holding Italian citizenship, of all the other requirements laid down for the Italian citizens;
- c) have appropriate knowledge of Italian.

These requirements must be met on the date of expiry of the deadline for submitting the application for the admission to this selection.



This Administration guarantees equality and equal opportunities between men and women as to access to employment and treatment at work.

### **Article 3 Exclusion from the procedure**

The following reasons are causes of exclusion:

- lack of signature on the application form;
- lack of admission requirements as provided for by Art. 2;
- failure to meet the procedures for submitting the application as mentioned under the following Art. 4.

The applicant is admitted if selected; should additional investigations be necessary, the applicant must regularize his/her application within the time peremptorily established.

The Administration may decide to exclude the applicant from the selection launched with this call, at any time, by reasoned Chancellor's Decree.

### **Article 4 Terms and conditions for submitting application**

Under penalty of exclusion applications for participation in the competition, along with the relevant qualifications held and the relevant scientific publications, **shall be submitted online** through the following online application procedure:

<https://pica.cineca.it/unibg/>

The candidate will be able to register and access the platform using the Public Digital Identity System (SPID - security level 2). In case the candidate does not have one, he or she can request it according to the procedure indicated on the website [www.spid.gov.it](http://www.spid.gov.it). Alternatively, the candidate can register and log in using the credentials released directly by the PICA platform.

It is of utmost importance to provide a valid email address in order to enable the registration process on the electronic procedure.

Applicants shall upload all personal and professional data as requested by the application procedure; all documents must be uploaded in PDF format (.pdf). Each applicant can produce a maximum of no. 40 publications and a maximum of no. 40 other titles and qualifications.

**Failure to comply with the online application procedure will result in exclusion of the applicant.**

Prior to final submission, and within the given deadline for applications submission, the online application procedure allows to modify and save the inserted information in a draft copy.

Confirmation of final submission date will be certified by an automatic notification email.

Submissions after the given deadlines will not be accepted by the system, as the online application procedure won't be accessible.

Each application will be given a registration number. For all further communications, the registration number shall be quoted along with the code of the research grant competition.

The online application and submission procedure shall be completed **by 11.10.2021, until 12:00 (Italian time)**.

The submission of the online application must be completed and finalized:

- **no digital signature:** in this case the candidate have to download the pdf file of the application by the system; the PDF file shall not be modified in any way, It is to printed, signed in original, scanned in a pdf file and uploaded again on the website;
- **sign the application on the server using ConFirma service:** in order to sign digitally the application it is necessary to have an hardware ( e.g. smart card or USB with digital signature certificate issued by an approved certification body) compatible with ConFirma service; after signing, applicants can download the signed pdf application;
- **sign the application digitally on your PC:** In order to sign digitally the application it is necessary to have an hardware ( e.g. smart card or USB with digital signature certificate



issued by an approved certification body) and a software for digital signatures in order to create a pdf.p7m file from the pdf file downloaded from this site. The pdf.p7m file must be uploaded in the website again;

- **in case of submission of the application through SPID**, it will not be necessary to sign the application form as it is automatically acquired by the procedure.

**The application must contain all the required data by the system and must be signed and accompanied by a valid identification document of the candidate, under penalty of exclusion.**

For any technical problems, contact support through the link available in the footer <https://pica.cineca.it/unibg>.

## **Article 5 Admission application**

The applicant, filling the application, must declare, under his/her own responsibility, pursuant to what provided for by Presidential Decree 445/2000 and following amendments and integrations, as follows:

- his/her citizenship;
- to possess the qualifications mentioned in the previous Art. 2, indicating the degree cycle/CUN Area of PhD, the date on which it was obtained, the Institute that issued it and the final vote/assessment achieved; the applicant with qualification(s) obtained abroad must declare to have obtained the relevant recognition indicating in the application the details of the provision or must annex the required documentation according to what specified hereby;
- to possess any other requirements as mentioned in Art. 2;
- to possess other qualifications useful for the assessment;
- to know the foreign language required by this call; the applicant with citizenship other than Italian must also declare to have an adequate knowledge of Italian;
- in case of Italian citizenship: to be enrolled in the electoral lists, specifying the Municipality of belonging and possibly specifying the reasons for non-inclusion or cancellation from the same lists; in case of foreign citizenship: to possess civil and political rights in the Country of belonging or provenance, or the reasons for non-possession of the same;
- not to be excluded from the active political electorate;
- to have no criminal convictions, or declare possible convictions undergone, indicating the details of related sentences, and any pending criminal proceedings;
- to be/not to be a state employee, specifying to be/not to be a regular employee at Universities and other bodies as mentioned in Art. 22 of L. No. 240/2010;
- to have no degree of kinship or affinity, up to and including the fourth degree, with a professor from the relevant structure or with the Chancellor, the General Manager or a member of the University's Board of Directors;
- if enrolled in a Diploma di Laurea (DL), Diploma di Laurea Specialistica (LS), Laurea Magistrale (LM), PhD with study grant or medical specialisation, in Italy or abroad, to be aware that, in the event
- of awarding of the grant, attendance at such courses and the use of the PhD study grant are incompatible with the holding of the contract;
- to hold research grants awarded pursuant to Art. 22 of Law No. 240/2010;
- to hold contracts as fixed-term researcher pursuant to Art. 24 of Law No. 240/2010;
- to have attended a PhD indicating the period, University, date on which the qualification was obtained, cycle, exact title of the course and CUN Area;
- period of enjoyment of any PhD study grant;
- address to which communications concerning this competition are to be sent; it is mandatory to indicate a personal e-mail address as well;



- possible request to conduct the interview via videoconference indicating the phone number and motivation.

In the application for participating in the competition, the applicant, pursuant to Law No. 104 of 5 February 1992, must specify any aid necessary in relation to his/her needs, as well as any need for additional time for the interview.

When submitting the application for participating in the selection, the applicant must annex the following documents:

1. a photocopy of the applicant's identity document in course of validity;
2. *curriculum vitae* in European format, dated and signed;
3. a list, signed by the applicant, of the publications and other research products, and other titles considered appropriate for the purposes of the selection such as specialisation degrees, certificates of attendance to postgraduate courses, obtained in Italy or abroad, contracts, study grant or research assignments both in Italy and abroad (cf. Annex B);
4. any publications, other research products or other titles that the candidate wishes to assert to the purpose of the procedure, numbered in progressive order matching the relating numbered list;
5. in the event of foreign applicant, it is necessary to annex: a copy of the residence permit (if the applicant is already in its possession).

As regards qualifications obtained abroad, for admission to the selection, the applicant is required as follows:

- if recognised as valid in the Italian territory, the applicant must indicate in the application the details of comparability/equivalence of the qualifications obtained abroad;
- if not recognised as valid in the Italian territory, the applicant must annex copy of the qualification obtained abroad (obligatory annex) with a declaration translated in Italian or in English language and a certified copy of the declaration of equivalent qualification (obligatory annex), issued by the competent Italian diplomatic and consular authorities abroad, with the certificate of the exams taken or the diploma supplement.

As regards all other qualifications obtained abroad which the applicant intends to provide for the selection as required by the call, it is necessary to annex to the application a copy of the qualifications. Each annex must be in PDF format and must not be larger than 30 MB.

Pursuant to Law No. 183/2011, the Administration cannot accept or request certificates, but only declarations in lieu of certifications or affidavits submitted in substitution of the actual certificates signed by the applicant and submitted together with an unauthenticated photocopy of the applicant's valid identify document. The Administration has the right to carry out suitable controls on the truthfulness of the contents of the declarations in lieu pursuant to what provided for by Presidential Decree No. 445/2000.

The requirements and the qualifications must be owned on the date of the expiry of the call.

It is mandatory to indicate a personal e-mail address to which the communications concerning this selection will be sent. Any variation of said address must be promptly communicated to the Selections Office and Legal Management (*Ufficio Gestione Giuridica e selezioni assegni di ricerca*).

## **Article 6 Examining Commission**

The Examining Commission is appointed with Chancellor's decree, upon proposal of the Structure's Council, at the expiry of the deadline for submitting the application.

## **Article 7 Selection**

During its first meeting, the Examining Commission will establish the assessment criteria and procedures explicitly, according to what provided for by the call, fixing a minimum score for admission to the interview.



The overall assessment is expressed in hundredths, as indicated hereafter:

- up to a maximum of 60 points for qualifications and scientific-professional curriculum; to that end, the following will be object of assessment:
  - graduation vote;
  - PhD (if not already provided for as requirement for admission);
  - specialisation degrees and certificates of attendance to postgraduate courses, obtained in Italy or abroad;
  - publications and other research products;
  - documented research activities – as long as the beginning date and duration of the activities are duly certified – carried out at the premises of public and private subjects with contracts, study grants or assignments, both in Italy and abroad;
- up to 40 points for the interview.

Within the context of its autonomy, the Commission can integrate the above, depending on the research project and on what provided for by this call.

**In particular will be evaluated:**

CODE	
1	Experience in the field of structural design. Experience in the field of vulnerability assessment of existing structures; Experience in non-linear modeling of structural systems. Experience in optimization problems in the update of finite element models.
2	Skills in the research field: synthesis of porous polymeric matrix and their functionalization with organic molecules; functionalization (coating or grafting) of macromolecules for textile use. Furthermore, experience in the synthesis of hybrid organic-inorganic coatings for developing wearable sensors, and in the implementation of standards, especially in the textile sector, will be appreciated.
3	Skills in the research field: spectroscopic and morphological characterization techniques for materials. Study of the relationships between structure and physico-chemical properties of polymers
4	Automatic data analysis by means of applications developed in Matlab. Definition of methods for the usability analysis of IT solutions based on the use of sensors. Basic knowledge about motion capture systems and their use in medical applications. Master degree in Engineering and Management for Health.
5	Papers on national and international journals (topics: mathematical models for analysis and decision making in the energy sector). Speaker at national and international conferences. Participation to Summer schools and intensive courses.
6	/

The applicants will be informed before the interview on the results of the assessment of the qualifications.

The interview can be carried out via videoconference, if authorised by the Commission, as long as it is possible to recognise with certainty the applicant's identity, to be verified subsequently at the moment of the signing of the contract. To that end, the applicant must indicate in the application the request to carry out the interview via videoconference specifying the reasons. Failed connection at the time established or late connection, unless due to force majeure, will be considered as a renunciation to participate in the selection.

During the interview, the Commission will verify the applicant's ability to cover the topics and themes related to the research project and his/her knowledge of at least one foreign language, according to what provided for by the call.





CODE	PROGRAMME OF THE INTERVIEW
1	Behavior of existing structures; Finite element modeling in non-linear environment; Criteria for the structural improvement of existing bridges; Criticalities related to construction details in existing bridges; Seismic hazard and structural risk.
2	Chemical fundamentals of technologies for materials; Synthesis and functionalization of hybrid organic-inorganic coatings by sol-gel technique; Chemistry of materials for textile use; main techniques for textile finishing.
3	Chemical fundamentals of technologies for materials; Main techniques for characterizing materials; Wearable sensors, and main methodologies for detecting and monitoring sensors properties.
4	Sensors for the assessment of health parameters of a human being Sensor data analysis for the prevention of diseases caused by work activities Methods for the usability analysis of applications based on wearable sensors Motion Capture systems.
5	Mixed-integer linear programming models for long term investment decisions in the energy sector. Equilibrium models for the energy sector. The GAMS framework for developing optimization models
6	Discussion of the candidate's cultural profile and qualifications, with particular regard to his or her publications, his or her aptitude for research, with verification of his or her competence in the field of private law and knowledge of the topics covered by the research project. Assessment of knowledge of the English language. Subject: Private Law

The assessment of the knowledge of the foreign language (or foreign languages) as provided for by this call will be carried out during the selection according to the modalities established by the Commission. As regards foreign applicants, the knowledge of Italian will be assessed.

**The date and place of the interview will be communicated with at least a 20-day notice through a communication published on the website of University of Bergamo <http://www.unibg.it>, under the section "Concorsi e selezioni-Assegni. Borse e contratti di ricerca-Assegni di ricerca" supervised by the Ufficio Gestione giuridica e selezione assegni di ricerca.**

**This notice is to all intents and purposes an official communication. Any changes related to the date of the interview will be communicated to the admitted applicants with at least a 20-day notice through the publication of a communication on the University's website under the section "Concorsi e selezioni-Assegni. Borse e contratti di ricerca-Assegni di ricerca".**

Failure to show up at the interview will be considered as a renunciation to participate in the competition for all practical purposes.

At the end of the works, the Commission draws up the list of the applicants examined, indicating the votes obtained during the interview.

The Commission will draft the merit list in descending order according to the overall final score, which is obtained by adding the score of the qualifications and the score of the interview. The overall final score identifies the winner or winners, depending on the number of grants established for the competition.

Applicants will be inserted in the merit list if they obtain at least 30 out of the 40 points available for the interview.

In the event of equal score, the PhD or equivalent qualification obtained abroad will constitute a preferential qualification, if not required for admission; in the event of equal merit, the younger applicant will be preferred.

The merit list is approved, under the condition precedent of verifying the requirements provided for by the call, with Chancellor's Decree and published on the website under the section "Concorsi e selezioni-Assegni. Borse e contratti di ricerca-Assegni di ricerca". The term for submitting any appeals will run from the date of publication.



Should the winning applicant renounce to or withdrawal from the contract, the grant can be awarded to successful applicants according to the order of the merit list, upon prior resolution of the Research Structure.

### **Article 8 Signing of the contract and withdrawal**

The winning applicant, in possession of the mentioned requirements, will sign an autonomous work contract under private law with effect, normally, on the first day of the month following the month in which the acts are approved.

As regards foreign applicants needing a residence permit, the date of beginning of the contract will be postponed and subject to the completion of the issuing procedure of said permit.

In the event of admission with reservation for qualifications obtained abroad not recognized as valid in the Italian territory, the winner, prior to signing the contract must submit the documents requested by the office within the terms peremptorily established.

The winner of the selection, convoked by the Administrative Office to sign the contract, will lose the right to the grant for collaboration in research activities if he/she does not state to accept the contract or does not begin the activity within the established term, without prejudice to health reasons or causes of force majeure duly and promptly documented.

Each grant as mentioned under Art. 1 can be renewed, under the terms and conditions provided for by the above mentioned Regulations; in any case, the relationship established pursuant to Art. 22 of Law No. 240/2010, including the possible renewal, cannot last more than six years, including the possible renewal, with the exclusion of the period in which the grant was used in coincidence with the PhD within the maximum limit of the legal duration of the relevant course.

### **Article 9 Rights and obligations of the grant holder**

The employment relationship is governed by an individual contract, according to what provided for by the applicable laws and by the University's Regulations.

The research activity is flexible, it has a continuous nature, not merely occasional, and is carried out under the leadership of the Scientific Director, with autonomous conditions as to the research programme and its realisation, without any predetermined working hours.

The grant holder must refer to the Research structure that requested the activation of the contract.

The research activity of the grant holder is carried out within the context of the relevant Structure and in other Structures of the University on the basis of the research programme. Any research activities conducted outside of the University must be approved by the Council of the Research structure.

A period of permanence abroad is allowed at one or more qualified universities or research institutes, upon prior authorisation of the Council of the Research structure. During the period spent abroad, the amount of the grant will be increased by fifty percent to be charged to the Structure of reference or to the funds assigned to the Research structure.

The grant holder can participate in all the activities programmed by the Research structure for the promotion of researches and the dissemination of relevant results; he/she can be a member of the profit exams commissions, in quality of expert.

The Research structure must provide the grant holder all necessary support for realising his/her research programme, guaranteeing access to the equipment, the necessary resources and the use of the technical-administrative services.

The grant holder must comply with what provided for by the University's applicable Regulations on research integrity and ethics.

The winner of the selection who is entitled to the grant, at the time of the signature of the individual contract, should be committed, under penalty of forfeiture of the right to the research grant, to confidentiality and preventive transfer to the University of all intellectual property rights relating to the results produced and/or achieved during the research activities carried out at the University and she/he has the right to be recognized as the author of the his/her results achieved and/or products.



The University recognizes the application of the same economic conditions that the University Patent Regulation grants to its Professors/Researchers.

### **Article 10 Taxes, welfare, insurance and mission**

With reference to taxes, the grants are subject to what provided for under Art. 4 of Law No. 476/1984, while as regards welfare, they are subject to what provided for under Art. 2, paragraph 26 and following, of Law No. 335/1995, and following amendments. With reference to mandatory maternity leave, they are subject to what provided for by the Decree of the Ministry of Labour and Welfare of 12 July 2007, published in the Official Gazette No. 247 of 23 October 2007, and, as regards sickness leave, they are subject to what provided for by Art. 1, paragraph 788, of Law No. 296 of 27 December 2006, and following amendments.

In the period of mandatory maternity leave, the bonus paid by INPS pursuant to Art. 5 of the mentioned Decree of 12 July 2007 is integrated by the University up to the payment of the total amount of the research grant.

The University will cover the grant holder's accident insurance and civil liability toward third parties insurance within the scope of his/her research activity.

The covering of the grant holder's mission expenses is financed through the funds of the Scientific Director in charge or the Research structure, according to the modalities provided for by the University's regulations as to missions.

### **Article 11 Processing of personal data**

In accordance with articles 13 and 14 of Regulation (EU) 2016/679 (GDPR), on the protection of personal data, and with D. Lgs. n. 196 /2003 and subsequent amendments, it is made known that data is controlled and managed by the legal representative of the University of Bergamo, via Salvecchio 19, - 24129 Bergamo.

Data will be collected exclusively for the present bid purposes and will be kept only for the necessary time to complete the relevant procedures. The data treatment controller will be appointed within the managing unit in charge of bidding procedure, who will carry out the treatment with all due respect of propriety, legitimacy, scope, transparency and confidentiality of the treatment; and data will be used exclusively for purposes connected to the selection and further conferment of the role and possible contract drafting, as well as management of the following employment position, in compliance with current regulations. Data will be kept for the necessary time to accomplish the selection purposes, subject to the application of norms on document retention, and will be transferred uniquely to public administration bodies directly concerned with the juridical and economic position of the selected applicant, treated in compliance with current regulations and used for personal, welfare, insurance and fiscal position management. Data will be handled by appointed staff through the acquisition of printed and electronic documents and using, even digitalised, filing procedures, to guarantee confidentiality; data treatment will be carried out through a coordinated organization and processing system, applying elevated safety standards. Furthermore, data will not be used for profiling. Applicants who have provided their personal data will be able to access it and exercise their rights as by art. 16 to 22 of GDPR UE 2016/679. Any safeguard request can be addressed to the University Data Protection Officer, who can be contacted through the university website (Privacy and Personal Data Protection section), e-mail [dpo@unibg.it](mailto:dpo@unibg.it). In addition to the right of complaint which can be presented to the Italian Data Protection Authority, Piazza Venezia 11, 00187 Roma.

By presenting their application, candidates thereby authorise and fully consent to publication on the University institutional website of all information concerning the current bid, their own data and the contents of their CV in accordance with 111-bis of D.Lgs.196/2003 stating that, within the scope limits defined by art. 6, par. 1, letter b), of the Regulation, consent is not due for personal data present in a submitted CV.



### **Article 12 Person in charge of the procedure**

The Person in charge of the selection procedure within this call is Dr. Giovanna Gusmaroli, Service manager of the "Gestione risorse umane", Via dei Caniana, 2 - 24127 Bergamo, phone (+39) 035 2052 575 - 583 - 878, e-mail address: [assegni.ricerca@unibg.it](mailto:assegni.ricerca@unibg.it).

### **Article 13 Publication**

This call is published in the University's Official Registry, on the website of the Conference of the Italian University Chancellors ([www.cru.it](http://www.cru.it)), on the website of the Ministry of Education, Research and University (MIUR) at the link <http://bandi.miur.it>, and on the website of the European Union at the link <http://ec.europa.eu/euraxess> in the form of a notice.

The full competition and related annexed forms are available on the website of the University of Bergamo [www.unibg.it](http://www.unibg.it) under the specially devoted section "Concorsi e selezioni-Assegni. Borse e contratti di ricerca-Assegni di ricerca".

The call is also published on "Piattaforma Integrata Concorsi Atenei" (PICA) - link <http://pica.cineca.it/unibg/> from which it is possible to fill the application online for participation at the selection.

### **Article 14 Final provisions**

For all matters not provided for by this call, the following will be applied: Law No. 240/2010 and following amendments and integrations, the University's Regulations on the awarding of research grants, the University's Regulations in force, and the Regulations on employment relationships in the public administration.

THE CHANCELLOR  
(Prof. Remo Morzenti Pellegrini)  
Documento firmato digitalmente ai sensi  
dell'art. 24 del D. Lgs. 82/2005



## **ANNEX A**

### **PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 6 EARLY STAGE GRANTS FOR CONDUCTING RESEARCH PURSUANT TO ART. 22 OF LAW NO. 240/2010 AT THE DEPARTMENTS OF UNIVERSITY OF BERGAMO - TYPE B PICA CODE: 21AR012**

#### **RESEARCH PROJECT - CODE 1**

#### ***"Application of Existing Bridge Italian Guidelines"***

**Research structure:** Department of Engineering and applied sciences

**Duration of the grant:** 12 months

**Scientific Area:** 08 – Civil engineering and architecture

**Academic recruitment field:** 08/B3 – Structural engineering

**Academic discipline:** ICAR/09 – Structural engineering

**Scientific Director:** Prof. Paolo Riva

The aim of the project is to contribute to assessing the correct and uniform application of the Guidelines to the experimental sections under the responsibility of the various managing bodies identified by the CSLP throughout the national territory in accordance with Ministry of Infrastructure Decree no. 578 of 17.12.2020. This purpose will be pursued through the contribution to the supervision of the process of application of the Guidelines by the managing bodies. The activities also concern the classification of bridges and viaducts according to the multilevel approach proposed by the Guidelines and the risk assessment.



## **RESEARCH PROJECT - CODE 2**

### ***“Development of sensors for control, monitoring and safety at sea”***

**Research structure:** Department of Engineering and applied sciences

**Duration of the grant:** 24 months

**Scientific Area:** 03 - Chemistry

**Academic recruitment field:** 03/B2 - Principles of chemistry for applied technologies

**Academic discipline:** CHIM/07 - Principles of chemistry for applied technologies

**Scientific Director:** Prof. Giuseppe Rosace

The project aims to study and develop sensors for monitoring the quality of the marine environment with a quali-quantitative approach. It is intended to develop and optimize sensor systems for chemical parameters and evaluate environmental contaminants by meanwhile providing electronic interfaces for their integration into fixed (intelligent buoy) and mobile (drone/ship) systems. The selection among investigated sensors to be installed in monitoring systems will be carried out based on (1) the evaluation of testing and validation phases associated with analytical methodologies and analytical protocols of the monitoring; (2) performance of the available electronic interfaces with particular attention to analogue-digital conversion and the signal-to-noise ratio of the whole measurement process. The project aims to investigate selected molecules, characterized by specific sensing properties, to realize miniaturized transducers for the environmental sector, allowing the monitoring of specific parameters. In the literature, various molecules providing a colourimetric variation as a function of the presence of heavy metals have been investigated.. Among these, Alizarin Red S will allow investigating the presence of metal ions as an index of marine pollution. The polymeric matrix ables of hosting the functional molecules can be made using the sol-gel technique that, compared to other technologies, shows several advantages. First of all, the organic functional molecules can be immobilized into the inorganic matrix giving rise to a material characterized by high porosity and three-dimensional structure. The coatings developed show optical transparency in a wide range of wavelengths (from UV to IR), chemical and thermal stability. Other properties affecting the performance of the matrix, such as leaching of the dye and response time, flexibility, hydrophobicity (which will allow optimizing the performance of sensors), can be optimized by mixing inorganic precursors with organoalkoxysilanes (Ormosils).

Since Ormosils are among the most interesting precursors for realizing coatings with "stimuli-responsive" properties, they will be used in this project following the so-called "bottom-up" approach. The latter allows controlling structure, morphology and composition at the finest level of organic-inorganic molecular units that constitute the host matrix.



### **RESEARCH PROJECT - CODE 3**

#### ***“Development of sensors for control, monitoring and safety at sea”***

**Research structure:** Department of Engineering and applied sciences

**Duration of the grant:** 24 months

**Scientific Area:** 03 - Chemistry

**Academic recruitment field:** 03/B2 - Principles of chemistry for applied technologies

**Academic discipline:** CHIM/07 - Principles of chemistry for applied technologies

**Scientific Director:** Prof. Giuseppe Rosace

The project aims to study and develop sensors for monitoring the quality of the marine environment with a quali-quantitative approach. It is intended to develop and optimize sensor systems for chemical parameters and evaluate environmental contaminants by meanwhile providing electronic interfaces for their integration into fixed (intelligent buoy) and mobile (drone/ship) systems. The selection among investigated sensors to be installed in monitoring systems will be carried out based on (1) the evaluation of testing and validation phases associated with analytical methodologies and analytical protocols of the monitoring; (2) performance of the available electronic interfaces with particular attention to analogue-digital conversion and the signal-to-noise ratio of the whole measurement process. The research activity will be mainly focused on the characterization of the miniaturized transducers realized in the field of the project and intended for monitoring specific environmental parameters.

The developed optical transducer for heavy metal detection in seawater will therefore be studied by different characterization techniques throughout each step of the process.

In particular, during the synthesis step, both nuclear and infrared magnetic resonance spectroscopic techniques will be carried out to verify the effective immobilization of the selected organic functional molecules (such as alizarin red S) in polymeric matrices for the development of coatings sensitive to the presence of heavy metals. In the experimental and validation steps, UV-Vis spectroscopy will allow verifying the effectiveness of the optical transducer by colorimetric variations observed as a function of the presence of heavy metal ions. Furthermore, morphological characterizations (e.g. scanning electron microscopy, atomic force microscopy) and UV-Vis reflectance spectroscopy will be carried out on developed coatings to study the surface distribution of functional molecules in the film and its performance, respectively. The stimuli-responsive properties of the developed transducers will be correlated with a set of instrumentally acquired digital data for the optimization of the developed sensor.



## **RESEARCH PROJECT - CODE 4**

### ***"Use of innovative sensors to measure health parameters of an operator during work activities with a collaborative robot"***

**Research structure:** Department of Management, information and production engineering

**Duration of the grant:** 12 months

**Scientific Area:** 09 – Industrial and information engineering

**Academic recruitment field:** 09/A3 – Industrial design, machine construction and metallurgy

**Academic discipline:** ING-IND/15 – Design methods for industrial engineering

**Scientific Director:** Prof. Andrea Vitali

The WATCHMAN project aims to develop a hub of skills and experimentation on Computer Vision. The main goal is the definition of a new approach for the definition of a manufacturing processes (process innovation) with a high impact on product quality. The new approach is based on the creation of a methodology with a modular approach for the design of highly reconfigurable Machine Vision systems, thanks to the introduction of the latest technological innovations in artificial intelligence, vision systems, collaborative robotics and data management.

The research activity will be mainly focused on one work-package: COLLABORATIVE ROBOTICS-ERGONOMICS module.

The goal is the evaluation of innovative sensors for the measurements of operator's health parameters and the motion acquisition during the interaction with a collaborative robot. The acquired data allow the assessment of operator's health condition to analyze the ergonomics of workstation and prevent musculoskeletal disorders during the interaction with a collaborative robot





## **RESEARCH PROJECT - CODE 5**

### ***“Development of mathematical models for simulating the coupling of the electric system with the gas system for the long-term decarbonization of the national energy system”***

**Research structure:** Department of Management, information and production engineering

**Duration of the grant:** 12 months

**Scientific Area:** 01 – Mathematics and informatics

**Academic recruitment field:** 01/A6 – Operations research

**Academic discipline:** MAT/09 – Operations research

**Scientific Director:** Prof.ssa Maria Teresa Vespucci

The project aim is to develop mathematical models for simulating and analysing the coupling of the electricity system with the gas system for the realization of the European Green Deal program in 2050 and, more generally, for the transition from fossil to Renewable Energy Sources (RES), in order to achieve a significant reduction in CO<sub>2</sub> emissions of the electricity/gas system. The decarbonization paths set by the European Union promote RES in the energy system, especially in the electricity system, and the consequent evolution and transformation of the markets. Therefore, new simulation models are needed to study the evolution towards increasing integration of RES generation. Indeed, if the installed RES power generation capacity is above the peak load, an excess production will occur in the peak hours of RES power production. Part of the energy produced in spring and summer, the seasons with the highest RES power production, will have to be stored for use in the winter period. As no seasonal electricity storage systems are available, a possible solution will be to use the surplus to produce synthetic fuel (H<sub>2</sub>, CH<sub>4</sub>) using Power-to-Gas (P2G) systems. In fact, transforming electricity into fuel will make it possible to exploit the greater storage and transit capacities that characterize the gas system. The new simulation models will analyze highly decarbonized systems with very close interactions between the electrical system and the gas system, taking into account the gas network constraints, such as the transport capacity of the produced gas, the network storing possibility in case of a reduction in gas consumption, the consumption/production capacity of P2G systems. The analysis will consider a zero target for net GHG emissions in 2050, the main challenge being the identification of interactions, operation and roles of the electricity and gas networks, in a setting where the use of fossil fuels is reduced to almost zero, new carriers appear and the need for storage increases. The mathematical models will also take into account direct and indirect effects of interventions of the regulatory authorities (in Italy ARERA, the Regulatory Authority for Energy Networks and Environment), in order to evaluate their effectiveness in supporting the transition. In fact, the effects of rules introduced to support some technologies may be limited by the market reactions of non-supported technologies: if such reactions are not taken into account, scenario studies may overestimate the effects of regulatory policies. The complexity of the electrical system (e.g., in the Italian energy sector there are about one hundred operators) requires developing mathematical simulation tools that, starting from simple models applied to small realistic test cases (such as the IEEE test networks), consider increasing degrees of complexity



## **RESEARCH PROJECT - CODE 6**

### ***"Predictive justice and legal certainty"***

**Research structure:** Department of Law

**Duration of the grant:** 24 months

**Scientific Area:** 12 - Law studies

**Academic recruitment field:** 12/A1 - Private law

**Academic discipline:** IUS/01 - Private law

**Scientific Director:** Prof. Roberto Pucella

The possibility of predicting the outcome of legal proceedings seems increasingly suggestive.

The interest in this topic has found fertile ground in the progressive recourse to algorithms: just think of their use in the context of the functioning of medical devices or driverless cars, to mention perhaps the two most current experiences.

The use of algorithms has changed, for the better, the way of dealing with many problematic profiles, but it has also "destabilized" the traditional way of facing the inefficiency of the system: if the medical device or the car does not work, the traditional approach of the responsibility of the producer or of whoever is responsible, in the traditional sense, for the use of the product is usually followed; but if one moves to a system in which the operation is entrusted to artificial intelligence processes, the applicability of traditional rules enters or may enter into crisis due to the fact that they have been designed and developed for applications referring to man and his action, not to systems that replace him in whole or in part.

The question arises also in the framework of the application of law: one wonders if it is possible to enrich the judicial system of tools that allow to "predict" the possible outcome of the judicial decision, so as to facilitate the activity of the judge in the decision of the dispute, or of the lawyer who wants to know in advance the chances of a favorable outcome of the judgment not yet undertaken.

The algorithm, here, would be an instrument that, by resorting to the results of previous judgments, implemented by evaluative elements that distinguish the specific case (never identical to others), would allow the judge to easily reach the "right" solution of the matter.

The theme is reservoir of multiple questions, as fascinating as problematic and complex.

A model such as the one hypothesized implies, first of all, the use of "suitable" precedents, structurally adequate to form the basis on which to "predict" the outcome of future judgments; the most immediate dimension of the problem, but not the most complex, concerns the need to calibrate the algorithm so as to allow it to adapt the outcome to the different areas of law (civil, criminal, administrative, etc.) on which it is intended to be applied.

Our legal system is based on the general principle of art. 12 of the "preleggi", which prohibits anyone from interpreting the law by attributing an overall sense other than that made clear by the meaning of the words and the connection between them.

Only an effective system of law enforcement that ensures legal certainty can allow, in the abstract, the use of predictive justice models, whose effectiveness and admissibility in the system can not disregard the guarantee that the different model of finding the "right" outcome of the process will not sacrifice the "certainty" for the benefit of speed or simplification of the process.

The system already knows the instrument of the predictability of the outcome of the decision, for example in art. 348 bis c.p.c., which sanctions with inadmissibility the appeal that does not have a reasonable probability of being accepted; but it is still a criterion of ascertainment entrusted to the action of man, not of the machine.

The certainty of law is, here, ensured by the circumstance that the interested party adapts the law, albeit prospectively, to the case not yet before the judicial body; and of this interpretative operation he assumes responsibility.

But can we say that legal certainty is assured if this task is entrusted to the algorithm?



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And therefore: what space for a large-scale use of the predictive tool? What are the prerequisites for the use of the algorithm? What are the consequences - and to whom - for the hypothesis that the system falls into error?

If, as Weber observed, legal certainty is nothing other than the predictability of the judicial outcome, what balance is really imaginable between legal certainty and predictive "justice"?