

Call for Applications for the admission to the PhD programmes of the University of Udine in the Academic Year 2024/2025, 40th cycle, under the funding of the National Recovery and Resilience Plan (NRRP) with reference to the following measures: Ministry's Decrees n. 629 and 630 of April 24, 2024.

DISCLAIMER:

The official and legally binding Call for Applications is in Italian only. This document cannot be used for legal purposes and it is only meant to provide information in English on the Call for applications (University Chancellor's Decree n. 684/2024). Please refer to the official Call for Applications published on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine. Any changes and integrations will be made available on the mentioned above web pages. Therefore, no personal written communication shall be provided to applicants about examinations dates, competition results and deadlines regarding the enrollment.

ART. 1 – PhD PROGRAMMES

1. The University of Udine announces a Call for applications for assignment positions with scholarship linked to the fulfillment of specific research topics under the National Recovery and Resilience Plan (NRRP) funding, as part of the PhD programmes of the University of Udine, 40th cycle:

- Law and Innovation in the European Legal Space (Table 1)
- Industrial and Information Engineering (Table 2)
- Molecular Medicine (Table 3)
- Food Science (Table 4)
- Environmental and Energy Engineering Science (Table 5)
- Agricultural and Biotechnological Sciences (Table 6)
- Mathematical and Physical Sciences (Table 7)
- Clinical and Translational Medical Sciences (Scheda 8)
- Art History, Film Studies, Media Studies and Music (Table 9)

2. The PhD Programme positions listed in paragraph 1 last three years starting from the 13th of December 2024. They will start only after only after the funding has been granted by the Ministry of University and Research (MUR) and, with reference to the Ministry's Decree 630/2024, after agreements with the companies involved has been concluded, in accordance with the procedures provided for by the regulatory provisions:

- Ministerial Decree n. 629 of April 24, 2024 concerning "NRRP PhDs, innovative PhDs for public administration and cultural heritage, PhDs in programmes dedicated to digital and environmental transitions";
- Ministerial Decree n. 630 of April 24, 2024 concerning "Innovative doctorates that meet the innovation needs of companies and promote the recruitment of researchers from companies".

In any case, they cannot be started after the 13th of December 2024, unless otherwise provided for by the Ministry of Universities and Research (MUR).

3. The doctorate positions with scholarship referred to in paragraph 1 are made available from the resources and in accordance with the regulatory provisions referred to in paragraph 2. There are no positions without scholarship, therefore the PhD programme is automatically terminated if the scholarship is waived.

4. PhD positions with scholarship referred to in paragraph 1 may not be assigned to PhD students who have waived scholarships under the NRRP in the 38th cycle (DD.MM. 351/2022 and 352/2022) and in the 39th cycle (DD.MM. 117/2023 and 118/2023).

5. The doctoral paths will ensure compliance with the horizontal priorities and the DNSH principle (Do No Significant Harm) of the NRRP.



6. In this document the titles referred to people, shown in male form only, refer indiscriminately to people of all genders.

ART. 2 – GENERAL PROVISIONS

1. This Call governs procedures and criteria to access to the PhD programmes listed in art. 1 with reference to the positions with scholarship listed in art. 1.

2. Tables 1-9 are annexed to this Call for Applications and are integral part of it. They indicate for each PhD programme: the administrative location and associated location(s) (if any); locations for training, teaching and research; the coordinator; programme duration; curricula (if available); positions available and research topics; the website of the PhD programme; admission requirements; documents and qualifications to be attached to the application; the Selection Committee; the period abroad if provided (optional or mandatory); the period at a third party if provided (optional or mandatory); admission procedure (conduct of examinations; evaluation criteria; tests schedules; publication date of the list of admitted applicants to the interview and the final ranking list).

3. In the presence of additional funding under the NRRP (including after the conclusion of the competition procedures) with reference to the actions listed in art. 1 paragraph 2, the available positions listed in Tables (1-9) may be increased with an integration of the Call for Applications and its annexes as specified in paragraph 5, without prejudice to the submission deadline for the admission to the competition mentioned in art. 6.

4. Positions may be reduced as provided for in art. 1 par. 2 and art. 10 par. 2.

5. Any amendments and additions of this Call and its annexes are posted on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.

6. Only the Italian Call for applications has value of notification for all purposes, including for the invitations to the examination tests, if any.

7. Submission of the application through the online procedure, as stated in art. 6, implies the acceptance by the applicant of the provisions contained in this Call for Applications and in the Internal Regulation of PhD Programmes available on the PhD website of the University of Udine.

8. Any personal communications concerning this competition are sent to the applicant's e-mail address provided during the registration process as stated in art. 6, paragraph 2.

9. The University assumes no liability for the non-receipt of communications due to incorrect personal contact details provided by the applicant, for failure or delay in communicating changes thereof, nor for postal or electronic mishaps at any stage of the present competition procedure.

Art. 3 – ADMISSION REQUIREMENTS

1. Applicants of any nationality may apply for the competition if they have one of the following academic degrees at the expiration date of the call:

a) "Laurea Specialistica" or "Laurea Magistrale" or "Laurea vecchio ordinamento¹" or second level academic degree comparable to them;

b) foreign degree, issued by a foreign official institution, comparable in duration and level² to the degrees referred to in letter a) and that allows the admission to PhD programmes in the foreign system.

Tables 1-9 specify for each PhD programme the type of degree required for participation in the competition and any additional requirements.

¹ Degree awarded under the ante Decree of the Ministry no. 509 of November 3, 1999, modified with Decree of the Ministry no. 270 of October 22, 2004.

² Master of Science/Art



2. Applicants can apply for the competition, if they obtain the degree referred to in paragraph 1 by December 12, 2024. Failure to obtain the degree by December 12, 2024 shall result in forfeiture of admission to the PhD Programme. If applicants with the degree not yet obtained are winners, they are admitted and enrolled with reserve. They must certify their graduation in accordance with the provisions of art. 5 paragraph 5 no later than December 12, 2024.

Documentation must be submitted by filling in the form available on the website:

https://helpdesk.uniud.it/Login.jsp?manual=true&populateSR_id=42104

For the doctoral programme in Law for Innovation in the European Legal Space only, the achievement of a grade of 95/110 or higher is a requirement for admission or, for those who have not yet obtained the degree, a minimum examination average of 25/30.

3. All applicants are admitted to the competition on the condition that they meet the requirements of the Call. The University reserves the right to carry out sample checks³ and may exclude applicants at any time from the selection process if they fail to meet the requirements as set out in the present article, even after the PhD programmes has already started.

Art. 4 – ACADEMIC DEGREE OBTAINED ABROAD (art. 3 paragraph 1 letter b)

1. The suitability of the foreign degree is assessed by the Selection Committee (art. 7) for the only purpose of participating in the competition and the enrolment in the PhD programme in accordance with:

- the current legislation in Italy and in the country where the degree was issued;
- treaties or international agreements on recognition of the degrees for further studies.

The Selection Committee assesses the suitability of the foreign degree on the basis of the documentation attached through the online application for the admission to the competition (articles 5 and 6). The Selection Committee may, therefore, exclude the applicant whenever the documentation submitted does not provide sufficient evidence for the evaluation. Therefore applicant must attach all the documents in his/her possession relating to the degree held, in order to provide sufficient elements for the Selection Committee's assessment.

2. Applicants with a degree obtained in a foreign university - if winners of the competition - must submit during the enrolment procedure (if they have not already submitted it during the online application), under penalty of exclusion from the PhD Programme, one of these documents:

Degrees issued by a country joining to the Lisbona Convention (<https://www.enic-naric.net/>), one of the following documents:

- Diploma *Supplement* in English issued by the relevant University;
- "ARDI Certificate of Correspondence and Foreign Degree Verification Certificate" issued by CIMEA (**Information Centre on Academic Mobility and Equivalence**). The Foreign Degree Verification Certificate is issued through «diplome» service at <http://cimea-diplome.it/>

Degrees issued by a country not joining to the Lisbona Convention (<https://www.enic-naric.net/>), one of the following documents:

- Declaration of value of the obtained degree and the certificate relating to the degree with examinations and marks. The certificate in a language other than Italian or English must be accompanied by an official translation into one of these languages (certified by the competent diplomatic-consular authority or sworn at a court in Italy);
- "Statements of comparability and verification of the foreign degree"- CIMEA" issued by CIMEA (Information Centre on Academic Mobility and Equivalence) through «diplome» service at <https://cimea.diplome.it/>

If the above mentioned documents are not available at the time of the enrolment procedure, the applicant must **show** having made a request by that time and submit it within the first year of the PhD Programme.

³ Under Article 71 of D.P.R. December 28, 2000, no. 445

Art. 5 – QUALIFICATIONS SUBJECT TO ASSESSMENT AND DOCUMENTS TO BE SUBMITTED

1. Applicants must submit the mandatory documents and qualifications specified for each PhD programme in Tables 1-9. Failure to submit even one of the mandatory documents or qualifications will exclude the candidate from the selection.

2. In Tables 1-9 optional documents and qualifications required by each PhD programme are also listed.

3. For a correct submission of the application, candidates are invited to use the forms attached which are integral part of the Call.

4. Documents and qualifications referred to in paragraphs 1 and 2 must be submitted in Italian or English, under penalty of exclusion of the candidate from the selection or non-evaluation of the same, as the case may be. Documents and qualifications, originally in a different language, must be accompanied by a translation into Italian or English made by the candidate, under his/her responsibility. With reference to the thesis only, the translation may be an extended abstract.

5. **Candidates who are Italian citizens or citizens of an European Union state** must submit a substitutive declaration of certification (Self-Certification) and, if necessary, a declaration in lieu of affidavit with regard to the academic qualification required for admission (indicating the academic degree, academic institution providing it, year of achievement, grade obtained) and the publications and other qualifications possessed, indicating for each of them all the identifying elements necessary for the Commission's evaluation. If the subject of the Self-Certification is not well identified in terms of its nature, duration, time location and the institution concerned, the Examination Board will not evaluate it. The Administration reserves the right to carry out appropriate checks on the truthfulness of the statements content; in the event of a false statement, the provisions of art. 76 of Presidential Decree No. 445/2000 and art. 483, 485, and 486 of the Penal Code are applicable. The University will disregard any certificates attached by candidates who are Italia citizens or European Union citizens.

Citizens of a non-European Union state regularly residing in Italy may use substitutive declaration of certification (Self-Certification) only to declare states, personal qualities or facts certifiable or attestable by Italian public entities, subject to the special provisions contained in laws and regulations referred to the discipline of immigration and the foreigners condition.

Citizens of non-EU states authorized to reside in Italy may use substitutive declaration of certification (Self-Certification) only in application of international conventions between Italy and the applicant's country of origin.

Non-EU citizens, other than those referred to in the preceding paragraphs, may not use the declaration of certification (Self-Certification).

6. The only documents evaluated are those the applicant has submitted within the deadlines and the manners specified in art. 6. Documents submitted in any other way are not evaluated.

7. Failure to submit the mandatory documents specified in Tables 1-9 and in the manner stated in the Tables shall constitute grounds for exclusion from the competition. Exclusion may be ordered at any time and will be notified exclusively by e-mail message to the e-mail address indicated in the application form.

Art. 6 – APPLICATION FOR ADMISSION

1. Entries to competitions begin on **Friday July 19, 2024 at 02:00 p.m. (Italian time)** and end on **Wednesday August 21, 2024 at 02:00 p.m. (Italian time)**.

2. **The application for admission to the competition must be completed, under penalty of exclusion, using the online procedure** that involves two stages:

- **Stage I – Registration at the University website** (<https://uniud.esse3.cineca.it>): it allows the applicant to obtain a username and password (credentials) in order to continue with the next stage⁴;
- **Stage II – Completing the online application** (<https://uniud.esse3.cineca.it>): at the end of this stage applicant must print out the application form and keep it together with the receipt of the fees payment (paragraph 8 of this article) as proof of application for the competition.

3. Instructions for registration to the University website and for apply for admission to the competition are available on the PhD website of the University of Udine.

4. Documents, qualifications and publications as stated in art. 5, must be attached to the online application in electronic format (.pdf), except for the letters of reference. **Files and/or folders, compressed in RAR or ZIP format, cannot be larger than 5 MB.** The applicant can add, delete or modify the attached documents even after the conclusion of stage II, but before the expiry of the call on **Wednesday August 21, 2024 at 02:00 p.m. (Italian time)**. The university administration assumes no liability if the documentation submitted is illegible because of damaged files or folders.

5. Every folder/file attached must be named as follows: surname of the applicant_PhD programme_document (e.g.: McDONALD_Food and Human Health_Curriculum).

6. Letters of reference, if provided by the PhD competition (Tables 1-9), must be uploaded directly by the referee via the online procedure at the candidate's request. During the submission of the application, the applicant must enter the email address of the referee, who will receive an email notification with the instructions to proceed for uploading the letter. Applicant and referee receive a notification about the successful upload of the letter, which will be available only for the Area Servizi per la Ricerca – Ufficio Formazione per la Ricerca and for the Selection Committee. The applicant can make a reminder to the referee and replace his/her name with another one by the expiry date of the call (**August 21, 2024 at 02:00 p.m. Italian time**).

The referee must upload the letter of reference before **August 23, 2024**.

7. The admission to the competition requires the payment of euro 25.00 (as a contribution for participating in the competition). Applicants must pay the fee by **Wednesday August 21, 2024**. If the sum (EUR 25.00) is not paid by the day before the date of the preliminary meeting of the Selection Committee, the candidate's qualifications will not be evaluated and the candidate will not be admitted to the selection process. The dates of the Selection Committee's preliminary meeting will be posted by August 9, 2024 on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.

8. The amount referred to in paragraph 7 is not refundable for any reason and must be paid via PagoPA service using one of the following options:

- direct access in Esse3 system to one of the payment methods available in PagoPA using the data contained in the "Avviso di pagamento" (Notice of Payment) issued at the end of the online application (available on the "Student Administration Office/Payments" of Esse3 portal personal area);
- payment at bank branches and receivers authorized to pay via PagoPA showing the "Avviso di pagamento" (Notice of Payment) issued at the end of the online application (available on the "Student Administration Office/Payments" of Esse3 portal personal area);
- from your account with online services (if activated by the bank) or with credit card or prepaid card with IBAN. For payments by credit or prepaid card refer to the circuit related to the card, NOT to the bank issuing the card. You need to print or save the "Avviso di pagamento" (Notice of Payment - available on the "Student Administration Office/Payments" of Esse3 portal personal area) to have the data required to make the payment.

Applicants who are abroad and don't have an Italian bank account can **exceptionally** make a bank transfer to University of Udine's bank account: INTESA SANPAOLO

⁴ If the applicant already owns the credentials to access the reserved area (e.g.: former student of University of Udine) this step should not be considered.

IT59A0306912344100000046097 SWIFT/BIC BCITITMM entering "PhD competition – Applicant's Name and Surname" as reason for payment. Only in this case, the receipt of the payment have to be attached to the online application.

The payment is subject to the fees applied by the payment service provider.

9. Applicants who wish to apply for several PhD competitions have to submit several applications, attaching the required documents to each one and paying the fee for each one (paragraph 7). However, the applicant cannot apply for more than one curriculum in the same PhD programme.

10. Applicants with certified disabilities (valid disability certification under L. 104/92 - valid civil disability certification) or certified specific learning disorder diagnosis (under L. 170/2010) must indicate during the application for admission to the competition (see paragraph 2 of this article):

- their situation, attaching the certificate of disability or DSA;
- the need for aids for the performance of the tests.

Candidates with disabilities or DSA residing in foreign countries who intend to take advantage of the measures described above must submit the certification attesting to their disability or DSA status issued in their country of residence, accompanied by a sworn translation in Italian or English. The university bodies in charge of examining the certifications will ascertain that the foreign documentation attests to a condition of disability or specific learning disorder recognized by Italian law.

Differentiated arrangements for taking the test will be determined by the Selection Committee after verification of the documentation submitted. In particular, students with specific learning disorder will be granted additional time equal to 30 percent more than that defined for the admission test. In cases of particular severity, any additional aids may be provided.

For further information refer to the "Direzione Didattica e Servizi agli studenti (DIDS) – Servizio studenti con disabilità o dsa", tel. +39 0432 556804 - email: includi@uniud.it.

11. Applicants are advised not to wait until the last days before the deadline of the online procedure. The University assumes no liability for any malfunctions due to technical problems and/or overloading of the communication line and/or application systems.

Art. 7 – SELECTION COMMITTEE

1. The Selection Committee of each PhD programme is specified in Tables 1-9. Since the positions are linked to specific topics, the Selection Committee is entitled to ask for the support of experts, without voting rights, for a technical opinion.

2. Each Selection Committee appoints its own internal President and Secretary during the first meeting.

3. Before the qualifications assessment and before the start of the examinations, the Selection Committee establishes the evaluation criteria and the scores assigned to the qualifications and to the examinations, taking into account the criteria specified in Tables 1-9.

4. The Selection Committee meetings can be held remotely.

5. The Selection Committee expresses the assessment of suitability with the aim of awarding scholarships referred to in art. 10, paragraph 2.

6. The Selection Committee's tasks finish with the drawing up of reports and final ranking lists.

Art. 8 – GENERAL COMPETITION

1. Applicants' selection involves assessment of the qualifications and conduct of the examinations, in the manner and on the dates specified in Tables 1-9. Any changes or additions to the examinations

schedule are posted only on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.

2. Assessment of qualifications and examinations are held according to the following general provisions:

- a. the maximum score for overall qualifications and examinations is 100 (100/100). The maximum score for overall qualifications and examinations is 100 (100/100). PhD programmes with widely different curricula may have examinations diversified;
- b. the score for qualifications is 30 (30/100), the minimum score to be admitted to the first examination (written or oral) is stated in each table (1-9);
- c. the score assigned for the examinations is 70 points (70/100). Applicants are eligible if they obtain a score equal to or greater than 49 in the examinations;
- d. the final ranking is unique and is prepared, only for eligible applicants, by adding together the scores obtained in assessment of qualifications and in examination tests.

3. In order to attend the examination tests, candidates must present a valid identity document or other identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states are mandatory required to show their passport.

4. If the oral examination is held in person (see Table 1-9), candidates who are unable to attend it either because they are permanently resident abroad on the examination date or for valid and documented reasons, may ask the Selection Committee to hold the oral examination remotely attaching a motivated request to the on line application (**no later than August 21, 2024 at 14:00 Italian time**). Any requests may also be sent by ticket (https://helpdesk.uniud.it/Login.jsp?manual=true&populateSR_id=42104) after August 21, 2024, compatibly with the examination date and only for documented reasons not foreseeable on the date of the submitted application. Details of the remotely oral examination are communicated to the applicants at the e-mail address entered during the registration procedure referred to in art. 6 paragraph 2. The candidate must be present/available on the day and at the time communicated. The failure to communicate the personal address, the connection failure, the unavailability of the applicant on the day or in the established timetable are grounds for the exclusion from the selection process. These grounds for exclusion do not apply if the candidate appears on the day established for the interview in order to take in person the oral examination. The University accepts no responsibility in case of technical problems that do not ensure the proper conduct of the oral examination remotely.

Please note that if the Call provides for a remote interview, it is not necessary to enclose any request.

5. The University reserves the right to manage the oral examination remotely if restrictions on mobility and aggregation are introduced due to environmental or health emergency. The University will make this procedure known on the official register (<https://www.uniud.it/it/albo-ufficiale>) and in the PhD website of the University of Udine. In this case, the provisions of the above paragraph 4 shall be applied, insofar as they are compatible.

6. Oral examinations are public, including those which are conducted remotely.

Art. 9 – FINAL RANKING

1. The final ranking (art. 8) is posted on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine within the dates detailed for each PhD programme in Tables 1-9.

2. The university does not send out any communication to the applicants.

Art. 10 – ADMISSION TO THE PhD PROGRAMME

1. Applicants are admitted to each PhD programme according to the final ranking order and in accordance with the provisions of in this article.

2. Scholarship are awarded to eligible applicants as follows: according to the final ranking order and to the number of positions available, if the candidate has obtained the Selection Committee's assessment of suitability as to the consistency of his/her project and qualifications with the research topic of interest and with the criteria of the regulatory provisions listed in art. 1 par. 2.

2.1 Failure to award scholarships entails a reduction in the number of positions with scholarship.

2.2 If grade and requirements are equal, the economic condition of the candidate's household shall be the criterion of preference for the allocation of positions with scholarship⁵.

3. In the case of useful placement in more final ranking lists referred to different PhD programmes, the applicant must enrol in only one PhD programme.

Art. 11 – ENROLMENT

1. **Successful applicants must enrol using the appropriate online procedure according to the deadlines and conditions notified by email, under penalty of exclusion (art. 2 paragraph 8). Enrolment is considered as acceptance of the assigned position.**

2. Enrolment to the PhD programme is subject to the payment of the amount specified in art. 14 under penalty of exclusion, except for the exemptions provided for by the regulations on the right to study and referred to in the additional notice to the "Manifesto degli Studi" for the relevant academic year.

3. The amount referred to in art. 14 p.1 must be made via PagoPA service using one of the following options:

- direct access in Esse3 system to one of the payment methods available in PagoPA using the data included in the "Avviso di pagamento" (notice of Payment) issued at the end of the online application (available on the "Student Administration Office/Payments" of Esse3 portal personal area);

- payment at bank branches and receivers authorized to pay via PagoPA showing the "Avviso di pagamento" (notice of Payment) issued at the end of the online application (available on the "Student Administration Office/Payments" of Esse3 portal personal area);

- from your account with online services (if activated by the bank) or with credit card or prepaid card with IBAN. For payments by credit or prepaid card refer to the circuit related to the card, NOT to the bank issuing the card. You need to print or save the "Avviso di pagamento" (notice of Payment - (available on the "Student Administration Office/Payments" of Esse3 portal personal area) to view the data required to make the payment.

Applicants who are abroad and don't have an Italian bank account can **exceptionally** make a bank transfer to University of Udine's bank account INTESA SANPAOLO: **IT59A030691234410000046097 SWIFT/BIC BCITITMM** entering "Enrolment in PhD programme" as reason for payment. Only in this case, the receipt of the payment have to be attached to the online application.

4. During the enrolment process applicants must attach in electronic format the following documents:

- a passport photo (.jpeg format);
- a copy of a valid identity document (.pdf format): non-UE citizens must upload a passport scan;
- a copy of the Tax Identification Number, if available (.pdf format);
- the receipt of payment referred to in art. 14 (only if the payment is made on the bank account);
- the form of bank details (.pdf format);
- documents referred to in art. 4, for applicants with degree obtained abroad (.pdf format);
- other documents if required by the University of Udine (.pdf format).

⁵ Current legislation about the right to study, ISEE.

5. Enrolment will be completed by the University of Udine only once the funding has been granted and the agreements has been signed as referred to in art. 1, par. 2.

6. The amount referred to in art. 14 p. 1 is refunded to the successful candidate only if the funding is not granted by the Ministry of University and Research (MUR) or if the agreement is not concluded, following the procedures provided for by the regulatory provisions referred to in art. 1 paragraph 2.

7. Non UE Citizens must comply with the rules on visa and residence permits. A copy of the residence permit or – pending the release – the receipt of the application for the residence permit must be submitted to Area Servizi per la Ricerca – Ufficio Formazione per la Ricerca, via Mantica, 31 – 33100 Udine.

8. The university administration assumes no liability for loss of communications due to any errors that cannot be attributed to it.

Art. 12 – REPLACEMENTS

1. Candidates who do not enrol according to the deadlines referred to in art. 11 are considered to have withdrawn. The positions that have become available are assigned to other applicants according to the final ranking, taking into account provisions of art. 10.

2. The list of replacement applicants is posted on the official register (<https://www.uniud.it/it/albo-ufficiale>) and on the PhD website of the University of Udine.

3. Replacement applicants must enrol under the deadlines and conditions notified by email (art. 2 p. 8), under penalty of exclusion from the programme.

4. Any further replacements positions will be notified directly to the relevant applicants.

Art. 13 – SCHOLARSHIPS

1. Scholarships are linked to the development of the specific research topics (Tables 1-9).

2. Scholarships are awarded in accordance with art.1 and art 10.

3. Scholarships have a duration of three years, subject to the provisions of art. 19 p. 3, art. 20 p. 2 and art. 24 of the Internal Regulations for the PhD Programmes. Annual scholarships are renewed annually on condition that the PhD student has completed the planned activities program, as verified by the Teaching Board.

4. The annual gross amount of the scholarship is specified in Tables 1-9 and is subject to the social security tax (INPS a gestione separata). The scholarship is paid on monthly basis in the following month. The amount of the scholarship is increased for research activities abroad by the 50% (related to the minimum gross monthly amount of the scholarship as per Ministerial Decree 247/2022: 1,353.58 euros) for a total period indicated in Tables 1-9, unless further financial availability. In any case, the increase is due only for periods of continuous stay and longer than 30 days. Doctoral students also have an annual budget for research and training activities equal to 10% of the annual gross amount of the scholarship (related to the minimum annual gross amount of the scholarship as per DM 247/2022: 16,243.00 euros).

5. The scholarship cannot be assigned to those who have already received a scholarship to attend another PhD programme or an equivalent programme.

6. The scholarship cannot be combined with research grants or other scholarships awarded for any purpose, except for those awarded by national or foreign institutions useful to integrate the abroad

research activity of the PhD students. Further incompatibilities are defined by the Internal Regulation for the PhD programmes.

7. In addition to the rights and duties provided for by the relevant legislation (art. 17), in line with the regulatory provisions of art. 1 paragraph 2, the winner candidate accepting the scholarship:

- undertakes to carry out the planned period abroad and the period at the third party as specified in Tables 1-9, aware that the failure in carrying out this period, if it is mandatory, results in the revocation of the scholarship.

- undertakes to submit the research activity report, which also specifies the time commitment (divided into months at a third party, on site, abroad), according to the deadlines and conditions that will be notified by the University of Udine and in line with the regulatory provisions stated in art. 1 paragraph 2 and with the "Guidelines for Reporting on Investments in Doctoral Pathways of the NRRP",.

- undertakes to ensure the compliance with the obligations regarding communication and information provided for by art. 34 of the Regulation (EU) 2021/241, indicating in the project documentation that the Program is funded under the NRRP, with explicit reference to the funding of the European Union and to the NextGenerationEU initiative (eg using the phrase "funded from the European Union - NextGenerationEU"), putting the European Union's symbol into the project documentation and providing adequate dissemination and promotion of the Program, even online, both web and social, in line with the provisions of the NRRP Communication Strategy;

- is aware that any change of activities, project goals and expected results, if not previously authorized by the MUR, entails the revocation of the scholarship;

- is aware that the Teaching Board's negative judgement and the consequent non-admission to the following year of the PhD programme, the failure to obtain the degree and the withdrawal from the PhD Programme results in the revocation of the scholarship;

- is aware that he/she must comply with the principle "do not significant harm (DNSH)" to environmental objectives, pursuant to article 17 of the Regulation (EU) 2020/852 and ensure consistency with the NRRP positively assessed by the ECOFIN Council Decision of July 13, 2021.

The University of Udine may therefore takes action against the beneficiary for the return of the amounts received in the event of revocation or waiver of the scholarship.

Art. 14 – ACADEMIC FEES

1. For the Academic Year 2024/2025 is foreseen the payment of maximum amount of euro 276.00:

- university contribution, euro 100.00;
- regional tax for the right to university study, from euro 120.00 to euro 160.00 (economic condition of the applicant's family nucleus⁶);
- duty stamp, euro 16.00.

The amount will be requested at the moment of the enrolment and any exemption will applied in accordance with the current legislation.

2. However, the university administration reserves to adopt different regulations for the following academic years.

Art. 15 – PERSONAL DATA

1. The personal data collected under the procedure referred to in art. 6 are necessary for the proper management of the selection procedure, for any subsequent career management and for purposes related to the management of the services provided to students during the university PhD programme. The University of Udine is the "Data Controller". At any time, you can request access, corrections and, according to the University institutional purposes, the cancellation and limitation of the processing or oppose the processing of your data. You can always submit a complaint to the Italian Authority for data protection. The complete information is available on the University of Udine website in the section "privacy" accessible from this link: <https://www.uniud.it/it/page-speciali/guida/privacy>

⁶ Current legislation about the right to study, ISEE.



Art. 16 – HEAD OF PROCEDURE

1. The officer in charge of the proceedings is Dr. Sandra Salvador, Head of Area Servizi per la Ricerca of the University of Udine.

The PhD Office of the University of Udine is the Area Servizi per la Ricerca – Ufficio Formazione per la Ricerca, via Mantica n. 31 - 33100 Udine.

2. To request information, fill in the following forms available on the website of the University of Udine:

Information about the Call:

https://helpdesk.uniud.it/Login.jsp?manual=true&populateSR_id=42104

Information about Esse3:

https://helpdesk.uniud.it/Login.jsp?manual=true&populateSR_id=42094

Art. 17 – REFERENCE RULES

1. For matters not covered by this Call, please refer to the National legislation in the field of doctoral research mentioned in the introduction, to the Internal Regulations for the PhD programmes and to the Rules of Procedure relating to patents, the regulatory provisions listed in art. 1 paragraph 2 available on the website dedicated to the PhD programmes of the University of Udine.

TABLE 1 – PhD Programme in LAW AND INNOVATION IN THE EUROPEAN LEGAL SPACE

| THE PHD PROGRAMME | |
|--|---|
| Administrative location | University of Udine, Department of Legal Science (DISG), via Tomadini, 3, 33100 Udine, ITALY (tel. +39 0432 249520) |
| Associated location | University of Trieste (Department of Legal, Language, Interpreting and Translation studies) - piazzale Europa 1, 34127 Trieste, ITALY |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section "Description of research topics". |
| Coordinator | Prof. Paolo Giangaspero (giangasp@units.it) |
| Programme duration | 3 years |
| Curriculum | Private and Economic Area: IUS/07 Labour Law |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-social-science-and-humanities/law-and-innovation-in-the-european-legal-space/ph-d-programme/law-and-innovation-in-the-european-legal-space?set_language=en |

| ADMISSION REQUIREMENTS | |
|--|--|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea Specialistica/Magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

| DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|---|---|
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree). Minimum mark to be admitted to the selection process: 95/110. <u>Applicants with a degree not yet obtained</u> must submit certification or self-certification (in accordance with Art. 5 c. 5 of the Call) of the academic degree for admission to the doctoral program and the average grade of the examinations. Minimum average grade to be admitted to the selection process: 25/30. 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid personal identity document (for citizens of non-EU countries copy of passport, especially the pages with document number, photograph, personal data, place and date of issue, expiration date); |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Dissertation Thesis referring to the degree granting access to the doctoral programme. Candidates who, on the date of the call deadline, have not yet obtained the degree granting access to the doctoral programme, must submit an extended abstract in Italian or English signed by their supervisor (between 15,000 and 25,000 characters, included spaces). 2. Research project, dated and signed, elaborated within the NRRP research topic indicated in this table (between 5,000 and 10,000 characters, included spaces, in Italian or English); 3. Reference letters (max 2) from university professors, scientific researchers or other experts in the field (art. 6 of the Call); 4. Publications (max 3). |
| All qualifications must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|---------------------------|--|
| Appointed members | Marina Brolo – Full Professor – University of Udine Rocco Lo Bianco – Associate Professor – University of Udine Anna Zilli – associate professor – University of Udine |
| Substitute members | Valeria Fili – Full Professor – University of Udine |

ADMISSION

| GENERAL COMPETITION (art. 8 of the Call for Applications) | | | | |
|---|----|---------|---------------------|----------------|
| Positions available: 1 | | | | |
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| | | | | |

TABLE 1 – PhD Programme in LAW AND INNOVATION IN THE EUROPEAN LEGAL SPACE

| | | | | |
|--------------------------------------|----------|---|-------------|---|
| Positions WITH SCHOLARSHIP: 1 | 1 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3) and enterprise involved CUP G23C24001270005 | € 16,243.00 | Artificial Intelligence Act: impacts on the use of artificial intelligence systems in the context of public and private work and issues of (in)compatibility with other regulations (GDPR, Workers' Statute, Transparency Decree) - PTP Services SRL |
|--------------------------------------|----------|---|-------------|---|

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR).

| Competition procedure and test schedule | | | | | | | | | | | |
|--|--|-------------------------------|--------------------------|-------------------------------------|-------------------------------|-----------------------|---|----------------------------------|--------------|------------------|---------------|
| Evaluation of qualifications and oral test. | | | | | | | | | | | |
| For the evaluation, aimed at ascertaining the candidate's aptitude for scientific research and his/her basic preparation for the purpose of carrying out the PhD program, the Selection Committee can attribute up to 100 points, at most 30 points to the titles and at most 70 points to the oral examination. | | | | | | | | | | | |
| Candidates who score at least 15 points in the evaluation of qualifications are admitted to the oral test. The minimum mark to be admitted to the selection process is 95/110; for applicants with a degree non yet obtained the minimum average score is 25/30. Success in the oral test requires the achievement of at least 49 points. Eligibility for the doctoral course is achieved by passing the oral test. For eligible candidates only, the score from the evaluation of qualifications is added to the score obtained in the oral test. | | | | | | | | | | | |
| DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE ORAL EXAMINATION: within August 30, 2024 | | | | | | | | | | | |
| DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024. | | | | | | | | | | | |
| Language that can be used for examinations | Exams may be taken in Italian or English. | | | | | | | | | | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | <table border="1"> <tr> <td>Curriculum vitae et studiorum</td> <td>10 points max</td> </tr> <tr> <td>Scientific publications (maximum 3)</td> <td>3 points max</td> </tr> <tr> <td>Dissertation/abstract</td> <td>5 points max</td> </tr> <tr> <td>Letters of reference (maximum 2)</td> <td>2 points max</td> </tr> <tr> <td>Research project</td> <td>10 points max</td> </tr> </table> | Curriculum vitae et studiorum | 10 points max | Scientific publications (maximum 3) | 3 points max | Dissertation/abstract | 5 points max | Letters of reference (maximum 2) | 2 points max | Research project | 10 points max |
| Curriculum vitae et studiorum | 10 points max | | | | | | | | | | |
| Scientific publications (maximum 3) | 3 points max | | | | | | | | | | |
| Dissertation/abstract | 5 points max | | | | | | | | | | |
| Letters of reference (maximum 2) | 2 points max | | | | | | | | | | |
| Research project | 10 points max | | | | | | | | | | |
| Oral examination | <p>The oral examination may be carried out in Italian or English.</p> <p>The oral test consists of an interview covering the qualifications, examinations and research project, as well as general topics pertaining to the following scientific-disciplinary field (SSD): IUS/07 - Labor Law.</p> <p>Each candidate will be asked questions on general topics related to the SSD indicated in the application.</p> <p>The interview will be evaluated according to the following criteria: level of knowledge of the proposed topics; criticality of the expository approach; appropriate use of legal language; aptitude for the preparation and development of the research project.</p> <p>English language proficiency will also be tested during the oral examination.</p> | | | | | | | | | | |
| Calendar of the oral examination | <table border="1"> <tr> <td>Date</td> <td>September 5, 2024</td> </tr> <tr> <td>Time</td> <td>9:15 AM (Italian time)</td> </tr> <tr> <td>Place</td> <td>University of Udine, Department of Legal Science (DISG), via Tomadini 3 - 33100 Udine, ITALY</td> </tr> </table> <p>Based on the number of applicants, the oral examination may take place in more than one day.</p> <p>To attend the examination tests, candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport.</p> | Date | September 5, 2024 | Time | 9:15 AM (Italian time) | Place | University of Udine, Department of Legal Science (DISG), via Tomadini 3 - 33100 Udine, ITALY | | | | |
| Date | September 5, 2024 | | | | | | | | | | |
| Time | 9:15 AM (Italian time) | | | | | | | | | | |
| Place | University of Udine, Department of Legal Science (DISG), via Tomadini 3 - 33100 Udine, ITALY | | | | | | | | | | |

| Description of research topics |
|---|
| <p>Research Topic 1. - Artificial Intelligence Act: impacts on the use of artificial intelligence systems in the context of public and private work and issues of (in)compatibility with other regulations (GDPR, Workers' Statute, Transparency Decree) <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> The project acts as an enabler of Mission 1 (digitalization, innovation, competitiveness, culture and tourism), and in particular of the M1C1 (digitization, innovation and security in the PA) and MIC2 (digitalization, innovation and competitiveness in the production system) components.</p> <p>The analysis of the new regulatory context, of a supranational matrix, applicable to the supply, use and marketing of artificial intelligence systems – a technology capable of driving the digitization of the country system – represents an indefectible prerequisite for achieving the digitization objectives set by the PNRR. The project's relevance to the above-mentioned issues also emerges with the unprecedented complexity of the legal landscape of reference. The coexistence of multiple regulations abstractly applicable to the use of artificial intelligence systems in the context of public and private work requires a critical analysis of the areas of overlap of the various relevant regulatory corpora, which is oriented towards the pursuit of the objectives of the PNRR, the institutional and/or statutory needs of companies and public entities and the related compliance strategies. In addition, the project, also focusing on the impacts of this new complex regulatory apparatus in terms of preventing and combating algorithmic discrimination in the workplace, intercepts two of the three cross-cutting priorities of the PNRR (those relating to generational and equal opportunities).</p> |

TABLE 1 – PhD Programme in LAW AND INNOVATION IN THE EUROPEAN LEGAL SPACE

Objectives and expected results, proposed research activity, methodologies and content:

The project aims to map and critically analyze the most relevant impacts deriving from the application of the new European regulation on artificial intelligence in the context of private companies and public bodies, also considering the relationships of this legislation with others already in force, both supranational (GDPR) and national (Workers' Statute, Transparency Decree). This is also to identify the areas of greatest complexity and criticality on which companies and public administrations will have to coordinate compliance efforts. In relation to this last aspect, it is also intended to develop a methodology useful for pursuing an integrated multi-regulatory compliance of artificial intelligence systems used in the workplace.

Period abroad (mandatory): 6 months

Foreign host entity data: to be defined

Period in enterprise (mandatory): 18 months

Enterprise data:

PTP Services SRL
Piazza Colonna n. 355, 00187 Roma (RM), Italy

Research activities to be carried out in the enterprise:

During the PhD period in the company, research and study activities will be carried out related to the application profiles of the regulations involved in the project, concerning the Artificial Intelligence Act and the GDPR. The PhD student will be able to study, develop and, if possible, already experimenting with the compliance methodology that is meant to be developed within the project.

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

The PNRR indicates as mission 4 the "strengthening of university education, with new scholarships, and the creation of new opportunities for young researchers, with the extension of research doctorates". As part of the research project, the candidate will have the opportunity to increase his/her knowledge/skills, starting from basic research that can evolve into technology transfer, through highly professional collaborations both at the company and internationally, expanding his/her prospects for future employment.

Professor/researcher of reference:

Prof.ssa Marina Brollo

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

| THE PhD PROGRAMME | |
|---|--|
| Administrative location | University of Udine, Polytechnic Department of Engineering and Architecture (DPIA) - via delle Scienze 206, 33100 Udine, ITALY (tel. +39 0432 558253) |
| Associated location | - |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section "Description of research topics". |
| Coordinator | Prof. David Esseni (david.esseni@uniud.it) |
| Programme duration | 3 years |
| Curricula | <ol style="list-style-type: none"> 1. New management paradigms and fabrication technologies for competitive enterprises with low environmental impact; 2. Information and communication technology for the inclusive society; 3. Design of innovative thermo-electro-mechanical systems and development of advanced methods for the assessment of structural damage and reliability for energy saving; 4. Mechanical technologies and electronic devices for domotics, medical diagnostic and safety. |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-physical-science-and-engineering/industrial-and-information-engineering/ph-d-programme/industrial-and-information-engineering?set_language=en https://phd.diegm.uniud.it/iie-phd/ |
| ADMISSION REQUIREMENTS | |
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |
| DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree); 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry). |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Master thesis ("Tesi di Laurea") associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call can submit an extended abstract in place of the complete thesis, in Italian or English, signed by themselves and by their thesis Supervisor (approximate limit: 25.000 characters, including spaces); 2. Motivational letter by which the applicant explains the reasons for admission to the PhD programme, dated and signed (approximate limit: 2,500 characters, included spaces); 3. Publications (max 2); 4. Letters of reference (max 2), from university professors, scientific researchers or other experts in the field (art. 6 of the Call). |
| All titles must be submitted exclusively in PDF format, dated and signed by the candidate. | |
| SELECTION COMMITTEE | |
| Appointed members | Guido Nassimbeni – Full Professor – Università di Udine Lauro Snidaro – Associate Professor – Università di Udine Marco Sortino – Associate Professor – Università di Udine |
| Substitute members | Roberto Rinaldo – Full Professor – University of Udine David Esseni – Full Professor – University of Udine Stefano Filippi – Full Professor – University of Udine |
| ADMISSION | |
| GENERAL COMPETITION (art. 8 of the Call for Applications) | |
| Positions available: 5 | |

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

| Detailed description | N. | Funding | Annual gross amount | Research program |
|--------------------------------------|----|---|---------------------|--|
| Positions WITH SCHOLARSHIP: 5 | 1 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3) and enterprise involved CUP G23C24001280005 | € 19,367.00 | <ol style="list-style-type: none"> 1. Identification and implementation of design solutions for cutting and milling tools aimed at minimizing vibrations and related noise through the use of advanced data acquisition and processing systems - Freud S.p.A. * 2. Apicus® on glass containers: Agile Robotic and AI-Based Approach for Complex Glass Containers Quality Control - Video Systems SRL 3. Innovating and Integrating Digital and Green Trajectories: Towards New Models and Managerial Tools for Industrial Automation - Danieli Automation S.p.A. 4. Use of Artificial Intelligence Systems for Improving Surgical Planning Tools in Orthopedic Surgery Applied to Knee Anatomy - LimaCorporate S.p.A. 5. Advanced Data Analytics for Smart Manufacturing: A Use Case for the MedTech Industry - LimaCorporate S.p.A. |

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR) and for positions marked with * after signing agreements with enterprises involved.

| Competition procedure and test schedule | | |
|--|---|--|
| <p>Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. The applicant is admitted to the oral examination if his/her titles receive at least 16 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE ORAL EXAMINATION: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024.</p> | | |
| Language that can be used for the exam | Italian or English | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae et studiorum | 15 |
| | Scientific publications | 5 |
| | Thesis/Abstract | 2 |
| | Letters of reference | 4 |
| | Motivational letter for admission to the PhD programme | 4 |
| Oral examination | <p>The oral examination consists of an individual interview of about 15 minutes aiming to assess the applicant flair to undertake a research doctorate and to carry out the research tasks in the areas of interest for the doctorate. The interview will be assessed considering the following criteria: a) technical and scientific competence in the topics of the doctorate; b) knowledge of the state of the art for the doctorate curricula; c) mastery of English.</p> | |
| Calendar of the oral examination | Date | September 5, 2024 |
| | Time | 09:30 AM (Italian time) |
| | How to conduct the examination | The oral examination will be held online. |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
|--|
| <p>Research Topic 1 - Identification and implementation of design solutions for cutting and milling tools aimed at minimizing vibrations and related noise through the use of advanced data acquisition and processing systems. <i>D.M. 630 of April 24, 2024 (PNRR Mission 4 Component 2 Investment/Sub-investment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> Research and development in the field of cutting tools, particularly regarding the relationships between design characteristics and vibrational phenomena, through the sensorization of experimental tests and automation of cutting operations for product performance evaluation. Digital transformation related to product development, digitization of laboratory test machinery in line with Industry 4.0</p> |

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

themes. Study on product optimization in terms of reducing vibrations and noise generated during tool use, reducing exposure for involved subjects, improving energy consumption during cutting, and extending the tool's lifespan. Additionally, the activities are fully aligned with M4C2 of the PNRR, addressing all indicated subpoints, namely:

M4C2.1: Strengthening research and spreading innovative models for basic and applied research conducted in synergy between universities and companies.

M4C2.2: Support for innovation and technology transfer processes.

M4C2.3: Enhancement of conditions supporting research and innovation.

Objectives and expected results, proposed research activity, methodologies and content:

Understanding the fundamental cause-effect relationships between tool design solutions and vibrations resulting during cutting operations in various conditions and applications. Specifically, research on laws and characteristic models of the considered tool (circular saws and mills). Measurement of the tool's natural frequencies, acquisition and analysis of forces and vibrations during cutting and milling processes. Definition and experimentation of tools with different design solutions to generalize and validate tool design rules, particularly aimed at minimizing vibrations and related noise.

Period Abroad (mandatory):

6 months

Foreign host entity data:

To be defined

Period in enterprise (mandatory):

18 months

Enterprise data:

Freud SpA

Legal Address: Via M.A. Colonna, 3, 20149 Milan (MI), Italy

Operational Site Involved: Via Remigo Solari, 7, 33050 Pavia di Udine (UD), Italy

Research activities to be carried out in the enterprise:

Design and prototyping of cutting and milling tools, development of product characteristics impacting vibrations and noise, such as the tensioning process for resonance frequency variation or the injection of damping material. Measurement of the tool's natural frequencies and execution of some experimental cutting and milling tests.

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

The program is consistent with the principles and specific obligations of the PNRR (National Recovery and Resilience Plan) in the following areas: innovation, digitalization, environmental sustainability, industrial competitiveness, health, and safety. The project proposes the development of new models and design solutions for cutting tools, promoting technological innovation. It will address the digitization of test machinery and the digital transformation of cutting operations, in line with Industry 4.0 themes. In terms of environmental sustainability and climate change mitigation, the optimization of tools to reduce vibrations and noise will be verified, improving energy consumption and extending the tool's lifespan. The results will contribute to creating relevant skills for the industry, improving the performance and safety of tools, contributing to the competitiveness of the manufacturing sector, and reducing exposure to vibrations and noise for operators, thereby improving working conditions.

Professor/researcher of reference:

Prof. Marco Sortino

Research Topic 2 - Apicus® on glass containers: Agile Robotic and AI-Based Approach for Complex Glass Containers Quality Control

Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)

Consistency of proposed research with NRRP areas of interest:

M4C2: FROM RESEARCH TO BUSINESS

The proposal aligns with the M4C2 "From Research to Business" component of the PNRR, which aims to increase the demand for innovation from businesses and integrate research results into the production system. The proposed research specifically aims to enhance high-level skills, particularly concerning Artificial Intelligence.

M1C2: DIGITALIZATION, INNOVATION, AND COMPETITIVENESS IN THE PRODUCTION SYSTEM

The proposal addresses themes from the M1C2 component "Digitalization, Innovation, and Competitiveness in the Production System," focusing on the transition to Industry 4.0 (Investment 1) with the concept of the Smart Factory in its Smart Production and Smart Energy components.

MISSION 4C2: INNOVATION NEEDS AND PROMOTION OF RECRUITMENT

The proposal also fits within the target of M4C2 "Introduction of innovative doctorates that meet the innovation needs of businesses and promote the hiring of researchers by businesses" (Investment 3.3), emphasizing the training of highly specialized young professionals for industrial integration and strengthening the national entrepreneurial workforce.

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

Objectives and expected results, proposed research activity, methodologies and content:

European manufacturing is undergoing significant change, aiming to reduce the environmental impact of industrial production, focus on energy-saving, and reduce waste beyond the Zero Defects paradigm towards Zero Waste through circular economy models. Video Systems aims to be a significant European player in this change, particularly in glass container production. The company plans to invest significant resources in developing technologies to achieve these goals, including integrating robotic solutions with artificial vision and AI for quality control systems that mimic human capabilities.

The typical scenario involves an anthropomorphic robot or cobot picking and manipulating an arbitrary object in front of various sensors (cameras, 3D scanners, etc.) to perform quality checks. Given the Agile production paradigm (small batches that change continuously based on market demand), there is a need for flexible new solutions with minimal operator intervention for control cycle programming.

The research will focus on developing a station for quality control of complex geometry glass containers (bottles, jars, vials). Activities will include studying new AI models for both robotic manipulation and product quality control. This vision involves designing and developing a quality control station focused on complex geometry glass containers like bottles, jars, and vials, with activities including:

- Advanced AI models to ensure precise and efficient object manipulation and quality control, dynamically adapting to production process variations.
- Advanced artificial vision systems to enable robots to accurately recognize and manipulate objects with complex geometries, improving process reliability and precision.
- Integration of robotics and AI for creating autonomous, highly efficient quality control systems with minimal human intervention.

Period abroad (mandatory): 6 months

Foreign host entity data: to be defined

Period in enterprise (mandatory): maximum 12 months

Enterprise data:

Video Systems SRL

Head office: Location Gorizzo n. 16, 33030 Camino al Tagliamento (UD), Italy.

Operational site involved: via Mangiarotti n. 4, 33033 Codroipo (UD), Italy.

Research activities to be carried out in the enterprise:

- Verification and in-depth study of research topics
- Physical testing of identified technologies
- Implementation of a pilot concerning the research solution

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

GREEN TRANSITION:

The proposed research aims to optimize processes and reduce production inefficiencies in glass manufacturing industries, leading to energy savings and waste reduction. These goals align with the Green Transition principles, focusing on environment and energy themes.

DIGITAL TRANSITION:

The AI techniques to be analyzed in the proposed research aim to optimize and automate production processes in glass manufacturing plants.

DNSH (Do No Significant Harm):

The research will focus on quality control algorithms to reduce the environmental impact of industrial production and Agile production, focusing on energy savings and waste reduction, thus adhering to the Do No Significant Harm principle.

Open science and FAIR Data:

Research results will be published in conference proceedings and scientific journals, following the National Research Program 2021-27 guidelines on Open Science and FAIR Data.

Professor/researcher of reference:

Prof. Lauro Snidaro

Research Topic 3. Innovating and Integrating Digital and Green Trajectories: Towards New Models and Managerial Tools for Industrial Automation

Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)

Consistency of proposed research with NRRP areas of interest:

M4C2: FROM RESEARCH TO ENTERPRISE

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

| |
|--|
| <p>The proposal addresses the need to enhance business demand for innovation and to integrate research findings into the production system. Specifically, the research examines how digitization and sustainability trends impact the business models and organizational processes of companies in the automation solutions sector, with a particular focus on technology providers for the steel industry.</p> <p>M1C2: DIGITISATION, INNOVATION AND COMPETITIVENESS IN THE PRODUCTION SYSTEM</p> <p>The proposal addresses the need to promote the transition to Industry 4.0 by leveraging energy-efficient smart technologies.</p> <p>MISSION 4C2: INNOVATION AND RECRUITMENT PROMOTION NEEDS</p> <p>The proposal meets the need for high-skilled personnel to enter the industrial world.</p> <p>GREEN TRANSITION:</p> <p>The proposed research aims at process optimisation and reduction of production inefficiencies in energy-intensive sectors.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u></p> <p>The project aims to analyse how digitisation and sustainability trends are impacting the business models and organisational processes of companies operating in the field of automation solutions in the industrial sector, with a focus on technology providers for the steel industry. Specifically, the research intends to address two interconnected themes. The first concerns the integration of new digital logic in a traditional sector, considering opportunities and risks of an 'ambidextrous' approach, i.e. aimed at maintaining the current business while new opportunities are explored. This theme will be examined through the lens of performance measurement systems (PMS) and their strategic use in functions dedicated to innovation and research and development. The second theme concerns the valorization of digital innovations, particularly those affecting environmental sustainability, by exploring new business models based on servitization. The activities of the doctoral student--in collaboration with the research group and the company contact persons--will concern a review of the reference literature (e.g. PMS, digital transformation and green transition in industry, new business models), the development of qualitative/quantitative analyses (e.g. case studies, interviews with experts, secondary data analysis, primary data analysis of the reference company), the development and testing of managerial tools according to the design science approach (e.g. PMS for digital innovation). Expected results of the PhD course are academic publication in journals/conference on topics such as PMS for digital innovation and new business models for leveraging digital and green solutions. In addition, managerial tools and approaches will be developed for direct use by the company (e.g. PMS), as well as reports on the analyses carried out (e.g. case studies on digital revitalisation in the sector/related sectors).</p> <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> to be defined</p> <p><u>Period in enterprise (mandatory):</u> 12 months</p> <p><u>Enterprise data:</u> Danieli Automation S.p.A. B.Stringher Street n. 4, 33042 Buttrio (UD), Italy.</p> <p><u>Research activities to be carried out in the enterprise:</u></p> <p>The doctoral candidate will collect and analyze company data and information, ensuring confidentiality throughout the process. They will develop tools to support management, such as performance measurement systems (PMS), and test their effectiveness. To achieve this, the PhD student will have access to the company portal and will interface with senior figures in research and development, sales, and project management.</p> <p><u>Consistency of the doctoral program with the specific principles and obligations of the RNNP:</u></p> <p>In line with the PNRR objectives of mitigating climate change and protecting and empowering young people, the project: a) focuses on solutions that can help companies improve energy efficiency, reduce greenhouse gas emissions and promote more sustainable production practices; b) offers training and professional development opportunities to a young researcher/researcher, enabling the acquisition of advanced and specialised skills in the field of industrial digitisation and sustainability.</p> <p><u>Professor/researcher of reference:</u> Prof. Guido Nassimbeni</p> <p>Research Topic 4 - Use of Artificial Intelligence Systems for Improving Surgical Planning Tools in Orthopedic Surgery Applied to Knee Anatomy <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u></p> <p>M4C2: FROM RESEARCH TO BUSINESS</p> <p>The proposal aligns with the M4C2 "From Research to Business" component of the PNRR, aiming to increase the demand for innovation from businesses and integrate research results into the production system. The proposed research focuses on enhancing high-level skills, particularly in Artificial Intelligence.</p> <p>M1C2: DIGITALIZATION, INNOVATION, AND COMPETITIVENESS IN THE PRODUCTION SYSTEM</p> <p>The proposal addresses themes from the M1C2 component "Digitalization, Innovation, and Competitiveness in the Production System," focusing on the transition to Industry 4.0 (Investment 1) with the concept of Smart Factory in its Smart Production and Smart Service components.</p> <p>M6: HEALTH</p> |
|--|

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

Lima Corporate's primary production activity involves manufacturing orthopedic prostheses supplied to hospitals worldwide. The proposed research aims to facilitate and improve the accuracy of surgical procedures for implanting these prostheses, benefiting patient health.

Objectives and expected results, proposed research activity, methodologies and content:

PROJECT OBJECTIVES:

The project aims to use AI systems to create and improve digital tools for accurate planning and execution of orthopedic surgeries. It seeks to strengthen existing planning systems and introduce new AI techniques for greater flexibility. The scholarship will focus on studying and developing deep learning networks to autonomously segment knee anatomy, facilitating personalized treatment plans. Optimizing preoperative planning processes saves valuable time and resources, improving operational efficiency within healthcare facilities. Additionally, implementing predictive algorithms based on AI to determine the optimal surgical plan based on patient clinical data plays a vital role in helping surgeons model and visualize the best treatment, improving surgical precision and mitigating associated risks.

ACTIVITY PLAN:

The intervention themes can be divided into:

- A. Preparing datasets for training and validating diagnostic image segmentation algorithms.
- B. Studying 2D/3D segmentation methods to update algorithms. This activity will define the segmentation algorithm experimentation strategies, considering the anatomopathological characteristics of interest for dataset categorization and applying and combining classical and machine learning strategies for anatomy segmentation and expected accuracy scores for the patient's 3D anatomical model reconstruction algorithms.
- C. Training AI models for anatomical segmentation. This activity will apply machine learning methods to the identified datasets for correctly identifying anatomical structures under study. Methods with proven effectiveness in biomedical image segmentation will be compared, and heuristic methods will be investigated to overcome limitations in different approaches. Results will define the segmentation algorithm to be implemented in the company.
- D. Studying predictive models based on AI and/or deep learning that, given patient clinical information, help determine the optimal surgical plan or best treatment for the patient.

EXPECTED RESULTS:

The expected result in the first 18 months is a feasibility study that includes the state of the art and a set of proposed techniques as a range of implementable possibilities, along with one or more prototype algorithms or architectures whose accuracy will be verified against manually annotated cases.

In the second half of the research period, the expected result is a feasibility study on predictive models to determine the optimal surgical plan based on patient clinical data, accompanied by one or more algorithms or architectures implementing the selected model.

Period abroad (mandatory): 6 months

Foreign host entity data: to be defined

Period in enterprise (mandatory): 12 months

Enterprise data:

LimaCorporate S.p.A.

Via Nazionale 52, 33038 San Daniele del Friuli (UD), Italy

Research activities to be carried out in the enterprise:

The company will provide the candidate with the necessary tools to design and implement a prototype algorithm, leading to an accuracy study of reconstruction compared to manually segmented cases.

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

DIGITAL TRANSFORMATION:

The AI techniques to be analyzed in the proposed research aim to develop AI algorithms to assist in planning and executing orthopedic surgeries. The research will thus adopt innovative and intelligent techniques that significantly surpass current approaches.

DNSH (Do No Significant Harm):

The proposed research will not have environmental impacts and will therefore adhere to the Do No Significant Harm principle.

Open science and FAIR Data:

Research results will be published following the National Research Program 2021-27 guidelines on Open Science and FAIR Data.

Professor/researcher of reference:

Prof. Lauro Snidaro

Research Topic 5- Advanced Data Analytics for Smart Manufacturing: A Use Case for the MedTech Industry

Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

| |
|---|
| <p><u>Consistency of proposed research with NRRP areas of interest:</u></p> <p>M4C2: FROM RESEARCH TO BUSINESS</p> <p>The proposal aligns with the M4C2 "From Research to Business" component of the PNRR, aiming to increase the demand for innovation from businesses and integrate research results into the production system. The proposed research focuses on enhancing high-level skills, particularly in Artificial Intelligence.</p> <p>M1C2: DIGITALIZATION, INNOVATION, AND COMPETITIVENESS IN THE PRODUCTION SYSTEM</p> <p>The proposal addresses themes from the M1C2 component "Digitalization, Innovation, and Competitiveness in the Production System," focusing on the transition to Industry 4.0 (Investment 1) with the concept of Smart Factory in its Smart Production and Smart Service components.</p> <p>M6: HEALTH</p> <p>Lima Corporate's primary production activity involves manufacturing orthopedic prostheses supplied to hospitals worldwide. The proposed research aims to facilitate and improve the accuracy of surgical procedures for implanting these prostheses, benefiting patient health.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u></p> <p>PROBLEM DEFINITION:</p> <p>Lima has databases and aggregates derived from management systems such as ERP (JDEdwards), MES (Nicim), and PLM (Teamcenter) that interact according to system requirements and come from various company areas. In recent years, Lima has invested in operations to equip itself with an Industrial-IoT platform for acquiring process and production data from an increasing number of machines and sources. This dynamic results in a significant amount of structured, aggregated, or raw data in various data lakes, necessitating an integration and structuring approach to derive added value through analysis, integration, and synthesis.</p> <p>OBJECTIVES:</p> <p>The project aims to conduct advanced research to define, design, and develop various layers of analytics (Descriptive, Diagnostic, Predictive, and Prescriptive). Initially, given the need for integration between various contexts and databases, an additional objective is to define an architectural layer that provides for the automated integration of the various company data sources.</p> <p>ACTIVITIES:</p> <p>The activity plan to apply ADA for Smart Manufacturing at Lima Corporate involves defining a Data Model considering the various data sources. The collected data should be segmented into various clusters to be analyzed in subsequent phases. The second phase involves identifying the correlation between the segmented/classified clusters to find patterns and their dependence factor (influence) to capture insights and make future trend predictions. The third phase involves identifying algorithms and technologies to develop a POC model and verify the effectiveness and functionality of the design in the previous phases. Once verified, the final phase involves introducing the analytics layer into production contexts to validate the POC.</p> <p>RESULTS:</p> <p>The final result includes deploying the solution and integrating it into the company system to obtain the analytics layer.</p> <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> ENOVIS (location to be defined)</p> <p><u>Period in enterprise (mandatory):</u> 12 months</p> <p><u>Enterprise data:</u> LimaCorporate S.p.A. Via Nazionale n. 52, 33038 San Daniele del Friuli (UD), Italy.</p> <p><u>Research activities to be carried out in the enterprise:</u></p> <p>Description and documentation of the current company context from the data perspective present in the various functions for integration and aggregation. Advanced research to define and refine the Data Model with the various involved systems. Mapping the flow to design and develop the architecture. Defining pipelines for data analysis. Developing necessary algorithms for the Advanced Data Analytics layer. Deploying the solution in a cloud environment.</p> <p><u>Consistency of the doctoral program with the specific principles and obligations of the RNNP:</u></p> <p>DIGITAL TRANSFORMATION:</p> <p>The AI techniques to be analyzed in the proposed research aim to develop AI algorithms to assist in planning and executing orthopedic surgeries. The research will thus adopt innovative and intelligent techniques that significantly surpass current approaches.</p> <p>DNSH (Do No Significant Harm):</p> <p>The proposed research will not have environmental impacts and will therefore adhere to the Do No Significant Harm principle.</p> <p>Open science and FAIR Data:</p> |
|---|

TABLE 2 – PhD Programme INDUSTRIAL AND INFORMATION ENGINEERING

Research results will be published following the National Research Program 2021-27 guidelines on Open Science and FAIR Data.

Professor/researcher of reference:
Prof. Lauro Snidaro

TABLE 3 – PhD Programme in MOLECULAR MEDICINE

| THE PhD PROGRAMME | |
|--|--|
| Administrative location | University of Udine, Department of Medicine (DMED) –via Colugna 50, 33100 Udine, ITALY (tel. +39 0432 494301). |
| Associated location | C.R.O. - Centro di Riferimento Oncologico (National Cancer Institute Aviano) – via Franco Gallini 2, 33081 Aviano (PN) ITALY. |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section “Description of research topics”. |
| Coordinator | Prof. Alessandra Corazza (alessandra.corazza@uniud.it) |
| Programme duration | 3 years |
| Curriculum | - |
| Programme website | https://www.uniud.it/it/ricerca/lavorare-nella-ricerca/dottorato-ricerca/inostricorsi/area-life-science/scienze-biomediche-e-biotecnologiche/il-dottorato https://www.uniud.it/it/ateneo-uniud/ateneo-uniud-organizzazione/dipartimenti/dame/ricerca/dottorati/biomedical-biotechnological-sciences |

| ADMISSION REQUIREMENTS | |
|--|--|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea Specialistica/Magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

| DOCUMENTS AND TITLES TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|--|--|
| Mandatory documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree); 2. Curriculum vitae et studiorum, dated and signed, with emphasis on pre-doctoral experiences and on thesis activity (description of techniques acquired, personal contribution, etc.); 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 4. Research project, dated and signed, elaborated within the NRRP research topic indicated in this table (approximate limit 5,000 characters, included spaces, in English). |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Master thesis (“Tesi di Laurea”) associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call can submit an extended abstract in place of the complete thesis, in Italian or English, signed by themselves and by their thesis Supervisor (approximate limit: 25,000 characters, included spaces); 2. Motivation letter by which the applicant explains the reasons for admission to the PhD program, dated and signed (approximate limit: 1,000 characters, included spaces); 3. Publications (max 2); 4. Letters of reference (max 2) written by university professors, scientific researchers or other experts in the field (art. 6 of the Call). |

| SELECTION COMMITTEE | |
|---------------------------|--|
| Appointed Members | Claudio Brancolini – Full Professor – University of Udine Valentina Rapozzi – Associate Professor – University of Udine Teresa Gagliano – Associate Professor – University of Udine |
| Substitute Members | Alessandra Corazza – Associate Professor – University of Udine Barbara Frossi – Associate Professor – University of Udine Giulia Antoniali – Associate Professor – University of Udine |

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

| Positions available: 1 | | | | |
|--------------------------------------|----|--|---------------------|---|
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| Positions WITH SCHOLARSHIP: 1 | 1 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2) | € 17,805.00 | 1. Generation of macrocyclic peptide molecules for cancer therapy - Arzanya S.r.l. |

TABLE 3 – PhD Programme in MOLECULAR MEDICINE

| | Investment/Subinvestment 3.3) and enterprise involved CUP: G23C24001310005 | | |
|--|---|--|----|
| Competition procedure and test schedule | | | |
| <p>Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. Applicant is admitted to the oral examination if his/her titles receive at least 15 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD program if he/she passes the oral examination. Only for eligible applicants, the points attained in in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024 DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024</p> | | | |
| Foreign language that can be used for examination | Italian or English | | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae | | 11 |
| | Scientific publications | | 2 |
| | Thesis/Abstract | | 3 |
| | Letters of reference | | 2 |
| | Motivation letter for admission to the PhD program | | 2 |
| | Masters, additional training courses, experiences abroad, etc. | | 2 |
| | A research project, dated and signed, drawn up in coherence with the theme of interest, highlighting the contribution that the candidate can make to the development of the theme (indicative limit 5000 characters, including spaces). | | 8 |
| Oral examination | Part of the oral examination will be in English. | | |
| Calendar of the oral examination | Date | 5 September 2024 | |
| | Time | 09:30 AM (Italian time) | |
| | Place | Department of Medicine (DMED), Seminar Room – Piazzale Kolbe 4, 33100 Udine ITALY | |
| | Based on the number of applicants, the oral examination may take more than one day. Applicants must exhibit a valid ID for admission to the oral examination. Citizens of non-EU states must show their passport. | | |

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR).

| Description of research topics |
|---|
| <p>Research Topic 1. – Generation of macrocyclic peptide molecules for cancer therapy <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> The proposed research project covers disciplinary and thematic areas of the National Plan for Recovery and Resilience (NRP) and are consistent with the country's needs. The project is oriented towards i) enhancing the value of young people, ii) training highly qualified figures and iii) meeting the innovation needs of enterprises. Specifically, the project proposed here falls within both mission 4 "Education and research" ("From research to enterprise") and mission 6 "Health" ("Innovation, research and digitisation of the national health service"). The proposed project also complies with the principles of i) "Do Not Significant Harm (DNSH)" in that it envisages "no significant harm" to environmental objectives and does not hinder climate change mitigation, consistent with Article 17 of Regulation (EU) 2020/852; ii) "Open science" in that it envisages the use of a scientific process based on cooperation and the use of digital technologies to improve the dissemination of knowledge and the accessibility and reusability of research results (e.g. (e.g. publication of data in 'open access' scientific journals); iii) 'FAIR Data Principles' as it ensures that research data and the molecules generated are findable ('findable'), accessible ('accessible'), interoperable ('interoperable') and 're-usable'.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> Background: Histone acetylation is a key epigenetic modification that regulates gene expression. The acetylation state of histones is tightly controlled by two families of proteins: histone acetyltransferases (HATs) and histone deacetylases (HDACs). Acetylation is carried out by HATs and is linked to gene transcription, while deacetylation is mediated by HDACs and is associated with gene silencing. Genetic or epigenetic aberrations affecting the HATs/HDACs balance can result in altered gene expression profiles, chromatin remodelling and changes in nuclear architecture that may ultimately lead to tumour initiation and progression. In humans, the HDAC family comprises 18 members that can be grouped into five subfamilies (I, IIa, IIb, III and IV) based on their sequence homology and phylogenetic criteria. Although there are numerous HDACs involved in different types and stages of cancer, in this project we will focus our attention exclusively on class IIa HDACs, a subfamily comprising four members: HDAC4, HDAC5, HDAC7 and HDAC9. Aberrant expression of multiple class IIa HDAC enzymes has been linked to a variety of solid and haematological cancers, and several mouse models have demonstrated their potential oncogenic role. In most cases, an elevated level of HDAC class IIa is associated with advanced disease and adverse patient outcomes. Among the cancer types in which class IIa HDACs are frequently overexpressed are leiomyosarcomas (LMS), rare and aggressive tumours that can arise anywhere in the body. Current treatments are based on surgery and radiotherapy, but unfortunately, local recurrences and metastases occur in about 40% of patients. New therapeutic strategies are therefore urgently needed.</p> <p>Design goals The key role of class IIa HDAC proteins in the progression and proliferation of several types of cancer has favoured the development of inhibitors (HDACis) against this family. However, despite their structural and chemical diversity, most of the inhibitors developed so far have often shown poor activity or lack specificity and have failed in vivo. It is therefore important to develop new HDACis with</p> |

TABLE 3 – PhD Programme in MOLECULAR MEDICINE

greater selectivity and efficacy. In this research project, we propose a diametrically opposed approach. Instead of blocking the pseudocatalytic site and decreasing the already poor deacetylase activity of class IIa HDAC enzymes, which has been the main strategy applied so far, we propose to develop peptide macrocycles capable of recognising and selectively blocking less explored regions such as the binding site for myocyte enhanced transcription factor-2 (MEF2) located at the N-terminus of class IIa HDAC proteins. Protein-protein interactions (PPI) have often proved difficult to modulate using conventional small organic molecules. The protein-protein interface generally involves flat, extended surface areas that lack well-defined, deep pockets into which small molecules can fit. In contrast, macrocyclic peptides are larger (0.5-1.5 kDa) and have a balanced conformational flexibility/stiffness that allows them to bind to flat PPI interfaces with antibody-like affinity and specificity. Furthermore, peptide macrocycles possess favourable properties such as high proteolytic activity, adjustable half-life and good tissue penetration that make them attractive compounds for potent and selective inhibition of class IIa HDACs.

Plan of activities and expected results

The proposed doctoral research project involves the development of therapeutic molecules based on peptide macrocycles that can penetrate the cell membrane and selectively interfere with the interaction of the transcription factor MEF2 and class IIa HDAC proteins for the treatment of LMS. Although a tumour as rare as LMS is used as an initial model, the involvement of class IIa HDACs in other types of cancer, including some much more prevalent in the population, such as colorectal cancer, justifies the interest of an innovative start-up. The research activity consists of four 'work packages' (WP). The first phase (WP1) involves the screening and identification by means of yeast display technology of peptide macrocycles capable of selectively disrupting the interaction of the human MEF2 protein with class IIa HDAC proteins. Yeast display technology coupled with fluorescence-activated cell sorting (FACS) allows quantitative screening of large macrocyclic peptide libraries (10^9 - 10^{10} different molecules) within a short time frame. The 'libraries' of macrocyclic peptides available to Arzanya S.r.l. were designed to contain molecules smaller than 1500 Da. This reduced size should favour diffusion through the membrane and facilitate further engineering by peptidomimetic approaches. The presence of two or more cysteine residues makes it possible to obtain cyclic molecules with a compact structure and smaller hydrodynamic volumes. Cyclization itself provides an increase in rigidity, leading to greater stability and high binding affinity. The selection process involves incubating billions of yeast cells, each encoding a different macrocyclic peptide sequence expressed on the cell surface, with the recombinant biotinylated human MEF2 protein already available to Arzanya S.r.l. Four to six rounds of FACS will be conducted in order to select and enrich yeast cells expressing macrocyclic peptides on the surface that can bind human MEF2 with good affinity. The identity of the macrocycles will be revealed by means of next-generation sequencing (NGS) techniques. The second step (WP2) involves the synthesis and characterisation of identified macrocyclic peptides. These will be produced with an automatic solid-phase peptide synthesiser, purified by reversed-phase HPLC and further characterised by mass spectrometry (e.g. MALDI, ESI). The binding affinity will be measured by means of the fluorescence polarisation technique. If necessary, binding affinity will be confirmed by means of complementary techniques such as isothermal titration calorimetry and surface plasmon resonance. The selected macrocycles will be subsequently evaluated for their ability to affect the HDAC class IIa-dependent repression of a group of 10 genes known to be targets of HDAC class IIa proteins in LMS cell lines. These studies will be in collaboration with the Department of Medicine of the University of Udine. Macrocyclic peptides will be tested on different LMS cell lines, cell viability will be assessed, and transcriptome changes analysed by RNAseq. The third step (WP3) involves hit-to-lead optimisation using peptidomimetic approaches. These will allow the introduction of new, non-genetically encodable chemical groups that will enable the generation of macrocyclic molecules with superior pharmacological properties (e.g. greater stability in plasma and better tissue penetration and membrane diffusion). The fourth and final phase (WP4) involves the verification of the in vivo efficacy of the developed macrocyclic peptides. For this purpose, in vivo experiments will be performed to assess the pharmacokinetic, biodistribution and toxicity profiles of the macrocycles that showed inhibitory activity in vitro. In vivo studies will be performed in collaboration with the Department of Medicine of the University of Udine. The potential inhibitory effect on tumour growth will be assessed by measuring the tumour growth rate at the time of treatment and analysing tumour tissues by histology.

Conclusions

The aim of the present project is to develop new anticancer drugs capable of selectively blocking the interaction of class IIa HDACs with the MEF2 transcription factor. The targeting of these unexplored binding sites of class IIa HDACs with peptide macrocycles is unprecedented and therefore represents a novel approach. We will initially evaluate their efficacy against leiomyosarcomas, but these studies will also have value as a 'proof-of-concept' for a general approach that could be applied to other PPIs and cancer types. If successful, macrocyclic peptides could not only have important therapeutic applications, but also shed light on the role of MEF2 and HDAC class IIa protein interactions with other proteins and provide a better understanding of their molecular mechanism in the prognosis and progression of different cancer types.

Period abroad (mandatory): 6 months

Foreign host entity data:

Laboratory of Therapeutic Peptides and Proteins, Institute of Chemical Sciences and Engineering
School of Basic Sciences, Ecole Polytechnique Federale de Lausanne (EPFL), CH-1015
Lausanne (VD), Switzerland.

Period in enterprise (mandatory): 18 months

Enterprise data:

Arzanya S.r.l.
Head office: Via Rezzonico 6, 35131 Padova (PD), Italy
Operational site involved: Scientific Campus, Via Torino 155, 30172 Mestre (VE), Italy

Research activities to be carried out in the enterprise:

During the research period at Arzanya S.r.l., the PhD student will be involved in the development of new therapeutic molecules based on peptide macrocycles that can penetrate the cell membrane and selectively interfere with the interaction of the transcription factor MEF2 and class IIa HDAC proteins for the treatment of LMS. The project is interdisciplinary and spans the fields of molecular biology, biological chemistry, medicinal chemistry and bio-organic chemistry. The PhD student will have the opportunity to use the yeast surface display technique to rapidly and combinatorially identify macrocyclic peptides capable of binding the MEF2 protein with good affinity and specificity. The identified molecules ('hits') will then be synthesised by means of solid-phase peptide synthesis, purified by means of reversed-phase HPLC chromatography, their molecular weights determined by means of mass spectrometry techniques, and their binding affinities in solution determined by means of fluorescence polarisation (PF) assays. The pharmacological properties of the highest affinity macrocyclic peptide will then be optimised ('hit-to-lead') by medicinal chemistry techniques in order to increase both its plasma stability and membrane permeability. Finally, the inhibitory activity of the macrocyclic peptide will be tested in vitro by means

TABLE 3 – PhD Programme in MOLECULAR MEDICINE

of competitive assays with known ligands. In the optimisation phase, the doctoral candidate will be able to count on the valuable support of a structural biologist whose research group deals with the crystallisation and determination of the three-dimensional structure of macrocyclic peptide-MEF2 complexes, which is necessary to fully understand the molecular basis of the interaction and to better guide the design and synthesis of possible variants.

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

- Transversal priorities: it will be clearly stated in the call for applications that the applicant will be selected regardless of origin, religion, disability, age or sexual orientation.

- The project provides for the training of highly specialized personnel in the field of drug discovery using innovative biotechnological approaches, such as the identification, synthesis and engineering of macrocyclic peptides for therapeutic purposes in the field of oncology. Overall, it fully meets the issues related to innovation needs in the health-pharmacological field, which are strategic for the country and the region.

- DNSH: The study will not significantly affect the environment. Particular attention will be paid to the conscious use of means of transport, materials and reagents. Online platforms will be used for scientific meetings to limit the increase of CO₂ in the environment.

- Open science and FAIR Data: Data will be published in open access journals and when indicated they will be deposited in public databases.

Professor/researcher of reference:
Prof. Claudio Brancolini

TABLE 4 – PhD Programme in FOOD SCIENCE

| THE PhD PROGRAMME | |
|--|---|
| Administrative location | University of Udine - Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) – via delle Scienze n. 206, 33100 Udine, ITALY (tel. +39 0432 558600) |
| Associated location | - |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section “Description of research topics”. |
| Coordinator | Prof. Walter Baratta (walter.baratta@uniud.it) |
| Programme duration | 3 years |
| Curriculum | - |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-life-science/scienze-degli-alimenti/ph-d-programme/scienze-degli-alimenti?set_language=en |

| ADMISSION REQUIREMENTS | |
|--|---|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea Specialistica/Magistrale (ex DM 509/1999 and Decree DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

| DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|---|---|
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree). 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 4. Research project, dated and signed, elaborated within the NRRP research topics indicated in this table (approximate limit: 10,000 characters, included spaces, in English). |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Master thesis (“Tesi di laurea”) associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call can submit an extended abstract in place of the complete thesis, in Italian or English signed by themselves and by their thesis Supervisor (approximate limit: 25,000 characters, included spaces); 2. Publications (max 2); 3. Letters of reference (max 2), from university professors, scientific researchers or other experts in the field (art. 6 of the Call). |
| All qualifications must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|----------------------------|---|
| Appointed members | Sabrina Moret – Associate Professor – University of Udine Piergiorgio Comuzzo – Associate Professor – University of Udine Lucia Gramigna – R&D manager – Unigrà SPA |
| Substitute members | Laura Barp – Researcher (RTD-A)- University of Udine Franco Battistutta – Researcher - University of Udine Francesca Carella – R&D Junior - Oil&Fats - Contaminants– Unigrà SPA |

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

| Positions available: 2 | | | | |
|-------------------------------|-----------|----------------|----------------------------|-----------------------|
| <i>Detailed description</i> | <i>N.</i> | <i>Funding</i> | <i>Annual gross amount</i> | <i>Research topic</i> |
| | | | | |

TABLE 4 – PhD Programme in FOOD SCIENCE

| Positions available: 2 | | | | |
|--------------------------------------|----------|--|-------------|---|
| Positions WITH SCHOLARSHIP: 2 | 2 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3) and enterprise involved CUP G23C24001290005 | € 17,805.00 | 1 Characterization of mineral oil contamination in vegetable oils and fats and study of innovative and sustainable approaches for their mitigation, with a focus on the most toxic aromatic components – Unigrà S.p.a. * 2. Selection of wood for the production of quality wines - G. & P. Garbellotto S.p.A. |

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR) and for positions marked with * after signing agreements with enterprises involved.

| Competition procedure and test schedule | | |
|--|---|---|
| <p>Evaluation of titles and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. Applicant is admitted to the oral examination if his/her titles receive at least 21 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024</p> | | |
| Foreign language that can be used for examination | Italian or English | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae et studiorum | 10 |
| | Research project | 14 |
| | Scientific publications | 2 |
| | Thesis/Abstract | 2 |
| | Letters of reference | 2 |
| Oral examination | Part of the oral examination will be in English. | |
| Calendar of the oral examination | Date | September 4, 2024 |
| | Time | 9:00 AM (Italian time) |
| | Place | Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) – via Sondrio 2/A, 33100 Udine |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
|--|
| <p>Research Topic 1 – Characterization of mineral oil contamination in vegetable oils and fats and study of innovative and sustainable approaches for their mitigation, with a focus on the most toxic aromatic components. <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> Under the M4C2 component "From Research to Enterprise," aimed at supporting R&D investment, promoting innovation and technology diffusion, and enhancing skills by fostering the transition to a knowledge-based economy, the project aims to deepen knowledge on mineral oil contamination (complex mixtures of hydrocarbons of petrogenic origin, of different toxicological relevance) with particular reference to the aromatic fraction (MOAH) for which the introduction of a cumulative legal limit is under discussion, and to study the possibility of decontamination of edible oils and fats, promoting sustainable innovation aimed at obtaining more competitive and safer products (to safeguard consumer health and in line with food safety requirements), offering new opportunities for training and growth (investment line 3. 3) for the future employment of young, highly trained researchers.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> Project objectives include the development of analytical methods suitable for the characterization and evaluation of the different classes of MOAH (with the aim of separating the most toxic components with 3 and more benzene rings and low degree of alkylation, from the rest of MOAH, which represents the most abundant fraction) and the development of innovative methodologies for effective removal from contaminated vegetable oils and fats, at the refining stage. The research will be mainly aimed at studying the adsorption properties of conventional and non-conventional materials for the removal of mineral oils from vegetable oils and fats, with priority toward aromatic compounds (MOAH), without excluding saturated hydrocarbons (MOSH). The activity plan includes a preliminary study of the efficacy of already authorized adjuvants and activated carbons, and then evaluation of possible chemical-physical modifications and/or ex novo synthesis of materials (e.g., mesoporous silica nanoparticles, cellulosic aerogels, etc.). Decontamination techniques by other means, including biological, may also be considered. Laboratory tests, if found promising, will be taken to pilot scale wherever possible. The expected outcomes are: i) advancement of knowledge and analytical techniques for characterizing the MOAH fraction in vegetable oils (a pre-requisite for accurate toxicological risk assessment associated with exposure to these contaminants); ii) advancement of knowledge on potential techniques for decontaminating vegetable oils and fats from mineral oils, with particular attention to the fraction that includes suspected carcinogens and genotoxicants; iii) development and optimization at the laboratory level and, if possible, on a pilot scale, of a sustainable procedure for reducing contamination.</p> |

TABLE 4 – PhD Programme in FOOD SCIENCE

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| <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> to be defined</p> <p><u>Period in enterprise (mandatory):</u> 6 months</p> <p><u>Enterprise data:</u> Unigrà S.p.A. Gardizza Street n. 9/B, 48017 Conselice (RA), Italy.</p> <p><u>Research activities to be carried out in the enterprise:</u> Evaluation and sampling of the raw materials used, such as crude oils and fats, taking into account the different botanical and geographical origins. The origin of contamination related to crude oil obtaining practices can also be investigated at this stage. Study of the different stages of refining oils and fats to assess the influence of the various stages on the level of contamination; special attention will be paid to learning the operations and process conditions used in refining oils and to studying models, processes to be reproduced on a laboratory scale, with special attention to the process aids used. Pilot-scale testing of any adsorbents deemed promising and/or processes to be implemented over existing ones will be conducted where possible.</p> <p><u>Consistency of the doctoral program with the specific principles and obligations of the RNNP:</u> The NRRP for Youth indicates as mission 4 the "strengthening of university education, with new scholarships, and the creation of new opportunities for young researchers, with the extension of PhDs." As part of the research project, the candidate will have the opportunity to increase his or her knowledge/skills, starting with basic research that can evolve into technology transfer, taking advantage of highly professionalizing collaborations both at the company and internationally, expanding his or her prospects for future employment. The project is in line with the climate objective in that it is aimed at reducing the presence of contaminants, increasing the safety level of the industrial product, through the search for innovative eco-sustainable solutions.</p> <p><u>Professor/researcher of reference:</u> Prof. Sabrina Moret</p> <p>Research Topic 2 – Selection of wood for the production of quality wines <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> As part of the M4C2 component "From research to enterprises", aimed at supporting investments in R&D, promoting innovation and the diffusion of technologies, strengthening skills by encouraging the transition towards a knowledge-based economy, the project aims to identify online evaluation systems for the quality of wood with the aim of improving the performance of company production and satisfying the needs of wineries. The Company is a world leader in the production of large barrels and plays a primary role in the production of premium wines at a regional, national and global level. The implementation of objective assessments of the quality of the wood will allow greater production control by the company and better satisfaction of the needs of the cellars, satisfying the needs of a sustainable agri-food supply chain</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> <u>Objectives:</u> The selection of wood for the construction of barrels and the selection of barrels for aging wines is still based to empirical factors, both from the point of view of the cooperage industry and on the part of the wineries. The research project will focus on the identification of objective parameters for the online assessment of wood quality; this quality will refer both to the barrel producers (identification of the characteristics of the wood in relation to its chemical and physical properties), and to the winemakers, interested in the relationship between wood and wine and in the evolution of the wine itself. The investigation techniques used, in addition to further evolutions of the NIR, already consolidated in the company, will focus on the implementation of new techniques to evaluate the chemical and physical quality of individual staves. This will be accompanied, in an indissoluble way, by the direct test in winery to predict the evolution of the wine with the different classes of wood. <u>Expected results:</u> Rationalization of the techniques for assessing and managing the quality of wood compatible with the production chain, Interaction with the wineries to identify ways to manage the aging in wood of white and red wines. Creation of management skills and transfer of production skills to workers <u>Activity:</u> Bibliographic survey. Updating of NIR techniques, study of the interaction of red and white wine with wood. Testing of innovative uses of photometric techniques for the assessment and management of wood quality</p> <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> to be defined</p> <p><u>Period in enterprise (mandatory):</u> 6 months</p> <p><u>Enterprise data:</u> G. & P. Garbellotto S.p.A. Longon Street n. 2, 33077 Sacile (PN), Italy.</p> |
|---|

TABLE 4 – PhD Programme in FOOD SCIENCE

| |
|---|
| <p><u>Research activities to be carried out in the enterprise:</u> Evaluation and analysis of the production chain, selection and preparation of samples, interactions with test companies, access to statistics and company databases</p> <p><u>Consistency of the doctoral programme with the principles and specific obligations of the NRP:</u> - <i>cross-cutting priorities:</i> The experimental activities and the selection of candidates will be managed in compliance with the three transversal activities of the NRP - <i>do no significant harm - DNSH:</i> The implementation of the project activities envisages not to cause significant damage to the environmental objectives (so-called "Do No Significant Harm" (DNSH) principle), pursuant to article 17 of Regulation (EU) 2020/852. - <i>open science and FAIR Data:</i> Scientific results suitable for publication in open access</p> <p><u>Professor/researcher of reference:</u> Prof. Franco Battistutta and Prof. Piergiorgio Comuzzo</p> |
|---|

TABLE 5 – PhD Programme in ENVIRONMENTAL AND ENERGY ENGINEERING SCIENCE

| THE PhD PROGRAMME | |
|--|--|
| Administrative location | University of Udine - Polytechnic Department of Engineering and Architecture (DPIA) - via delle Scienze 206, 33100 Udine, ITALY (tel. +39 0432 558253). |
| Associated location | - |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section "Description of research topics". |
| Coordinator | Prof. Cristian Marchioli (cristian.marchioli@uniud.it) |
| Programme duration | 3 years |
| Curriculum | - |
| Course website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-physical-science-and-engineering/environmental-and-energy-engineering-science/ph-d-programme/environmental-and-energy-engineering-science?set_language=en https://phd.diegm.uniud.it/ees-phd/ |

| ADMISSION REQUIREMENTS | |
|--|--|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

| DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|---|---|
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree); 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 4. Research project, dated and signed, elaborated within the NRRP research topics indicated in this table (approximate limit 10,000 characters, included spaces, in English); 5. Motivational letter, dated and signed, by which the applicant explains the reasons for admission to the PhD programme (approximate limit 2,500 characters, included spaces). |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Master thesis ("Tesi di Laurea") associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call can submit an extended abstract in place of the complete thesis, in Italian or English, signed by themselves and by their thesis Supervisor (approximate limit 10,000 characters, included spaces); 2. Publications (max 2); 3. Letters of reference (max 2), from university professors, scientific researchers or other experts in the field (art. 6 of the Call). |
| All titles must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|----------------------------|--|
| Appointed members | Giovanni Capurso – Researcher – University of Udine Alex Lanzutti – Associate Professor – University of Udine Alessandro Trovarelli – Full Professor – University of Udine |
| Substitute members | Sara Colussi – Associate Professor – University of Udine Lorenzo Fedrizzi – Full Professor – University of Udine Cristian Marchioli – Full Professor – University of Udine |

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

| Positions available: 3 | | | | |
|-------------------------------|----|---------|---------------------|----------------|
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| | | | | |

TABLE 5 – PhD Programme in ENVIRONMENTAL AND ENERGY ENGINEERING SCIENCE

| Positions available: 3 | | | | |
|-------------------------------|---|---|-------------|---|
| Positions WITH SCHOLARSHIP: 3 | 3 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3) and enterprise involved CUP G23C24001300005 | € 19,367.00 | <ol style="list-style-type: none"> 1. Oxidation catalyst for volatile organic compounds in sulfur containing industrial exhaust gases - Treibacher Industrie AG * 2. Cryogenic treatments and coatings on the cutting edges of milling cutters and circular saw blades - Freud S.p.A. * 3. Study, development, testing of new composite containers for transport and in-vehicle storage of compressed hydrogen at high pressures - Faber Industrie S.p.A. * |

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR) and for positions marked with * after signing agreements with enterprises involved.

| Competition procedure and test schedule | | |
|--|---|---|
| <p>Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. The applicant is admitted to the oral examination if his/her titles receive at least 21 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles.</p> <p>DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024.</p> | | |
| Language that can be used for the exam | Italian or English | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae et studiorum | 12 |
| | Research Project | 6 |
| | Scientific publications | 2 |
| | Thesis/Abstract | 4 |
| | Letters of reference | 2 |
| | Motivational letter for admission to the PhD programme. | 4 |
| Oral examination | Interview based on technical, motivational and scientific discussion. | |
| Calendar of the oral examination | Date | September 4, 2024 |
| | Time | 02:30 PM (Italian time) |
| | Place | Polytechnic Department of Engineering and Architecture (DPIA), Auditorium ex DCFA, via del Cottonificio 108, 33100 Udine. |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
|--|
| <p>Research Topic 1 - Oxidation catalyst for volatile organic compounds in sulfur containing industrial exhaust gases <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> The proposal appears to be fully consistent with the NRRP areas related to the green transition and the synergy between universities and industry, aimed at creating more efficient systems to limit the climate-changing impact of industrial emissions. The proposal also aims at training young professionals with skills and qualifications suitable for managing the industrial transition towards a greener model. The planned activities are consistent with M4C2 of the NRRP: M4C2.1 - Strengthening research and dissemination of innovative models for basic and applied research in synergy between universities and industries. M4C2.2 - Support for innovation processes and technology transfer. M4C2.3 - Strengthening the support to research and innovation.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> Development of oxidation catalyst materials for the abatement of organic compounds in industrial exhaust gases. The material should be based on metal oxides and be resistant against sulfur poisoning.</p> <ol style="list-style-type: none"> 1. Literature research in sulfur stable metal oxides with catalytic potential; 2. Synthesis and characterization of materials; 3. Synthetic catalyst testing; 4. Sulfur poisoning tests and post-characterization; 5. Development of regeneration strategies; 6. Scale Up and Development of a Production process for the material. <p>Expected results:</p> |

TABLE 5 – PhD Programme in ENVIRONMENTAL AND ENERGY ENGINEERING SCIENCE

At the end of the PhD program, the student will be familiar with the main issues involving catalytic systems for the abatement of VOC (material synthesis, characterization, testing). It is expected that the research activity will result in the identification of Metal Oxides suitable for VOC Oxidation in SO₂ containing environment and of the key parameters of these materials to work as an oxidation catalyst. Understanding of SO₂ poison mechanisms and possible regeneration techniques is also envisaged as a main result.

Period abroad (mandatory):

6 months

Foreign host entity data:

to be defined

Period in enterprise (mandatory):

6 months

Enterprise data:

Treibacher Industrie AG
Auer von Welsbachstraße 1, 9330 Althofen, Austria

Research activities to be carried out in the enterprise:

The activities in the company will be focused on the scale-up of sulfur resistant materials for catalytic VOC abatement from hard-to-abate industries. In particular, synthesis, characterization and catalytic testing of catalytic materials suitable for oxidation of organic compounds in the gas phase will be carried out.

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

The proposal is fully consistent with the themes and lines of research of the PhD course, particularly with regard to climate change issues. Furthermore, the implementation of project activities is compliant with the horizontal principles of PNRR and is designed to avoid significant harm to environmental objectives (so-called "Do No Significant Harm" (DNSH) principle), according to Article 17 of Regulation (EU) 2020/852.

Professor/researcher of reference:

Prof. Alessandro Trovarelli

Research Topic 2 - Cryogenic treatments and coatings on the cutting edges of milling cutters and circular saw blades

Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)

Consistency of proposed research with NRRP areas of interest:

Increased efficiency and tool life, thus sustainability of the user's production process, with less waste of materials and resources. Reduced friction resulting in lower operating temperatures and reduced energy consumption. Zero environmental impact with PVD/PlasmaCVD coatings free of chromium, cadmium, lead and fluorinated substances (PFAS, PFTE). In particular, the activities are fully in line with M4C2 of the NRP, touching on all the sub-points indicated, namely:

M4C2.1 - Strengthening research and dissemination of innovative models for basic and applied research conducted in synergy between universities and enterprises.

M4C2.2 - Support for innovation processes and technology transfer.

M4C2.3 - Strengthening the support conditions for research and innovation.

Objectives and expected results, proposed research activity, methodologies and content:

Increased cutting tool performance for longer tool life and efficiency. Research and Development on base metal chemistry, cryogenic treatments and tribological and anti-wear coatings.

Period abroad (mandatory):

6 months

Foreign host entity data:

to be defined

Period in enterprise (mandatory):

18 months

Enterprise data:

Freud S.p.A.
Head office: M.A. Colonna Street n. 35, 20149 Milano (MI), Italy.
Operational seat: Remigio Solari Street n. 7, 33050 Pavia di Udine (UD), Italy.

Research activities to be carried out in the enterprise:

Study of the chemical composition and testing of products subjected to cryogenic treatment and trivet coatings on the carbide and cermet of plates used on circular saw blades and cutters.

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

The proposal is fully consistent with the themes and lines of research of the PhD course, particularly with regard to the sustainability of production processes through the strengthening of research and the dissemination of innovative models for basic and applied

TABLE 5 – PhD Programme in ENVIRONMENTAL AND ENERGY ENGINEERING SCIENCE

research. Furthermore, the implementation of the project activities envisages not to cause significant harm to environmental objectives (the so-called "Do No Significant Harm" (DNSH) principle), pursuant to Article 17 of Regulation (EU) 2020/852.

Professor/researcher of reference:

Prof. Alex Lanzutti

Research Topic 3 - Study, development, testing of new composite containers for transport and in-vehicle storage of compressed hydrogen at high pressures

Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)

Consistency of proposed research with NRRP areas of interest:

The proposal appears to be fully consistent with the NRRP's climate change issues. The development of a Type 5 cylinder for pressure storage of hydrogen would encourage the development of lighter and, therefore, more easily transportable cylinders. Moreover, the attention given to the disposal of these devices, would lower their environmental impact.

Objectives and expected results, proposed research activity, methodologies and content:

The aim of the project is to develop new type of container (cylinders) for industrial gases, classifiable as type 5 according to international designations, with high technical and functional performance in terms of strength, volume, and weight (as further specified below).

At present, a large part of the production of gas cylinders are type 1-3 cylinders (made entirely or partly of metal elements), and are intended for the traditional industrial, medical, or automotive natural gas sectors.

Market demand for type 4 cylinders (consisting of a thermoplastic liner that acts as a barrier and a reinforced composite that gives mechanical properties) has found an increase in recent years as a result of the widespread use of H₂ gas for many applications, primarily for the transportation sector but not only.

This field of use requires cylinders with volumes up to 300-400 liters, resistance to increased internal gas pressures up to 400-500 bar (for gas transportation) but also up to 1,000-1,100 bar for stationary storage systems.

To work safely at such high pressures, steel cylinders such as Type 1-3 certainly provide excellent structural strength, but they have a limitation in the form of their high specific weight (kg per unit volume of gas) and are therefore economically unfavorable in applications where light weight is desirable, such as in gas transportation in terms of cost for transportation (€/km/volume gas transported).

However, Type 4 also has important limitations, including liner collapse due to depression during unloading operations. To fully meet the new market demand (at least for applications where the above-mentioned factors are relevant), the optimal technical solution is therefore the type 5 cylinder (monolithic container made from thermoplastic and fiber-reinforced thermoplastic materials), which ensures, in particular compared to type 4:

- High mechanical strength performance, comparable to Type 1-3 and superior to Type 4.
- Excellent volume/container weight ratio, improving over Type 1-3 and also Type 4 (see liner thickness reduction).
- Possibility of reduction/elimination of contaminants and moisture, through vacuum conditioning operations, an operation not possible with type 4.

The behavior of cylinders in case of fire, it improves from type 4 to type 5, in relation to the fact that the presence of thermoplastic materials makes it inherently safe in container: in fact, the thermoplastic matrix at high temperature melts releasing pressure, without resorting to additional devices (pressure relief device).

To date, there are no commercial products on the market with the technical characteristics corresponding to a typical cylinder. There is only news of a company (based in Belgium) that produces monocoque cylinders made of thermoplastic material with fiber, intended for use as a container for sanitary water: the pressures involved are much lower than those of interest for gas sector, hydrogen, etc., and therefore in fact do not constitute a real solution to the objectives of the project.

In the specific area of industrial gas cylinders, no FABER competitor to date has presented a Type 5 cylinder, even at the prototype level, with the characteristics of interest.

The primary objective of the project is to develop a type 5 cylinder, volume approximately 350 l, max pressure 300-500 bar in the transport version; further objective will be to develop a version for mobility use on-board applications on vehicles with a maximum pressure of 700 bar. The final product will also have to meet all the specifications required by international standards, so that at the end of the project the procedures for certification can be initiated. The end-of-life recyclability aspects of the product will also be evaluated.

Activity plan:

see section "research activities to be carried out in the enterprise"

Expected Results.

The expected results of the project will consist of the development and prototyping of high-pressure hydrogen gas container, made of composite material, of the type called Type 5 (one-piece cylinder).

The elements of relevance, usefulness, originality of the project with respect to the state of the art, in case of a successful outcome of the project, will be considerable both in FABER and for the whole sector/area of interest, also taking into account that FABER covers a significant share of the specific market of tank cars in Europe.

Currently, there are no type 5 cylinders on the market with suitable and adequate characteristics for storage and transportation of hydrogen gas, at high pressure: this neither nationally nor worldwide. On the other hand, it is well known that the use of hydrogen as an energy source is expected to grow strongly in the coming years, particularly in the transportation sector. This development implies and requires an adequate distribution infrastructure, which will necessarily have to include within it the presence and use of cylinders (both storage and transportation) with adequate characteristics in terms of volume, maximum pressure, and cost.

In fact, in the short-to-medium term, it will not be possible to create a widespread and diffuse hydrogen gas distribution network (and beyond) to connect generation points with distribution/pickup points: in a concrete and realistic scenario (and a real one today), there will instead be physical networks interconnected by road transport. In this context, the non-availability of cylinders with adequate characteristics risks being a real bottle-neck in hydrogen diffusion.

Period abroad (mandatory):

6 months

TABLE 5 – PhD Programme in ENVIRONMENTAL AND ENERGY ENGINEERING SCIENCE

| |
|---|
| <p><u>Foreign host entity data:</u> to be defined</p> <p><u>Period in enterprise (mandatory):</u> 18 months</p> <p><u>Enterprise data:</u> Faber Industrie S.p.A. Dell'industria Street n. 64, 33043 Cividale del Friuli (UD), Italy.</p> <p><u>Research activities to be carried out in the enterprise:</u> Given that the goal of the project is a one-piece type 5) cylinder, it will be carried out according to successive steps, developing two different technologies and implementation solutions. The results achieved in the first step, in addition to constituting an initial project output, will form the basis for subsequent developments. Thus, the technological objectives of the project and the related activities to be carried out are: 1(a): development of type 4.5 cylinder (bringing the interface between liner and coating to fusion so as to obtain a one-piece product): Study and development of the liner: research and selection of materials compatible with the liner tape; Study and development of the reinforced outer tape: matrix, fiber, technology Development of related manufacturing technology Developments and experimentation for performance optimization, cost, weight reduction, etc. Pre-approval testing 1(b): development of type 5 cylinder: Development of the inner structure (inner waterproof layer, or pseudo-liner) with materials compatible with the tape coating Study of the outer tape: matrix, fiber, technology Development of related manufacturing technology Developments and experimentation for performance optimization, cost, weight reduction, etc. Pre-approval testing 2: Recyclability In cooperation with external supplier study the possibility of material recovery and reuse Evaluation of possible "noble" uses of recovered material The research topics and technical and scientific issues to be addressed are as follows: Today in FABER, the following technologies are used for the production of type 4 cylinders. For liner production, if working with HPDE as raw material, roto-moulding technology is used. More recently, FABER has switched to using PA and forming by blow molding technology. For making the outer liner, wet filament winding technology is mainly used, in which continuous carbon fiber, is impregnated with epoxy-based resin and wound onto the liner with special machinery. Then the semi-finished product is placed in an oven and brought to a temperature of about 120-130°C (curing), whereby the interface of the two materials (liner and winding) is melted. Alternatively, pre-impregnated fiber windings can be used, or still liner with tape reinforced on the inside with fiber. For the type 4.5 cylinder, a polyamide (PA)-based liner, made by blow-molding or roto-moulding technology, is intended to be used. Compared with the current PA, a PA formulation that is compatible and akin to the liner material will be studied together with raw material suppliers. Winding will be done with fiber-loaded tape, which is a tape with a thermoplastic resin matrix in which continuous fibers are embedded longitudinally. The machine that performs the winding will have to be studied and designed providing for the possibility of controlling not only the arrangement of the tape windings on the liner, but also the adjustment of tape tension, tape temperature, etc. Such technology is entirely new to FABER, nor are there any such systems commercially available except for a few experimental prototypes. IR lamps will be used, which by heating not only locally the deposition and adhesion zone of the tape on the liner, bring the materials to fusion. The process continues with overlapping deposition of n layers of tape. Experimental studies and developments will jointly address product (materials), technologies (processing equipment and systems), and process (control systems for process monitoring regulation). The next step is the development of type 5 cylinders. Part of the results achieved in the first step will be useful for these new developments, while other issues are entirely new. As mentioned earlier, now we do not have a process divided into two separate steps, i.e., creation of the liner first and subsequent coating of it, but the construction of the final cylinder begins with a deposition operation of a thermoplastic tape on a mandrel that serves as a support. The deposition operation takes place in a manner conceptually similar to that seen earlier for 4.5 cylinders in the liner coating step. The fundamental differences from the 4.5 -2nd step process are: - TP tape without fillers will be used, as the inner element performs purely gas barrier functions. The outermost layers will still be made of filled TP, to give minimal resistance to the "pseudo liner" that would otherwise collapse under the weight just as the spindle is pulled out for the next process step. - Different are the deposition conditions, in particular the lower process temperature for 4.5: here it is sufficient to bring the tape to local heating so as to adhere (edge to edge) the adjacent volutes of the tape. Then the mandrel is disassembled, and the boss consisting of an insert that is adhesively bonded to the "liner" is inserted. The semi-finished product is disassembled from the first machine and loaded onto the second processing unit similar to the winding unit used for the process for type 4,5. The process of deposition of the fiber-loaded tape on the liner, and concomitant local heating by IR lamps, is started. As the loaded tape, the same as that tested for type 4.5 will be used in the first instance. Partial differences may be noted related to the fact that in the case of type 4.5 the liner is obtained from thermoplastic by blowmoulding or roto-moulding, while in case 5 the liner is constructed from tape. Regarding the recyclability of the materials, the possibility of recycling the cylinders at the end of their useful life by grinding and using the loaded granules thus obtained will be examined: experiments will be carried out on material samples, involving on the one hand the manufacturer of the raw materials and of the tape in particular (raw materials designed from the beginning also for subsequent reuse), and on the other hand end users of the granule (molders). The purpose is to verify the potential field of use of the granules.</p> |
|---|

TABLE 5 – PhD Programme in ENVIRONMENTAL AND ENERGY ENGINEERING SCIENCE

The possibility of achieving degradation-free reuse of the material, i.e., the possibility of separating and recovering the long fiber from the web at the end of its life, will also be studied, albeit at an exploratory and preliminary level. There are potentially applicable technologies for this purpose, for which the technical and economic feasibility will be checked, in cooperation with the tape supplier

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

The proposal is fully consistent with the themes and lines of research of the PhD course, particularly with regard to climate change issues. Furthermore, the implementation of the project activities envisages not to cause significant harm to environmental objectives (the so-called "Do No Significant Harm" (DNSH) principle), pursuant to Article 17 of Regulation (EU) 2020/852.

Professor/researcher of reference:

Prof. Alfredo Rondinella

TABLE 6 – PhD programme AGRICULTURAL SCIENCES AND BIOTECHNOLOGY

| THE PhD PROGRAMME | |
|--|---|
| Administrative location | University of Udine - Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) – via delle Scienze n. 206, 33100 Udine, ITALY (tel. +39 0432 558600) |
| Associated location | - |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section “Description of research topics”. |
| Coordinator | Prof. Stefano Bovolenta (stefano.bovolenta@uniud.it) |
| Programme duration | 3 years |
| Curricula | 1. Biology and plant production; 2. Biology and livestock science; 3. Biology of pathogens and plant protection. |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-life-science/agricultural-sciences-and-biotechnology/ph-d-programme/agricultural-sciences-and-biotechnology?set_language=en |

| ADMISSION REQUIREMENTS | |
|--|--|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

| DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|---|--|
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (refer to art. 5 paragraph 5 of the Call) of the academic title needed for admission to the PhD programme (Laurea Specialistica/Magistrale programme or Italian programmes before D.M. 509/99 or foreign academic programmes); 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union must attach a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 4. Statement concerning the choice of research program(s). 5. Research project, dated and signed, elaborated within the NRRP research topic indicated in this table (approximate length of the project in English: 10,000 characters, included spaces). |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Master thesis (“Tesi di Laurea”) associated to the degree/title providing access to the PhD programme. Applicants who are not graduated by the expiration date of this call can submit an extended abstract in place of the complete thesis, in Italian or English, signed by themselves and by their thesis Supervisor (approximate limit: 25,000 characters, included spaces); 2. Publications (max 2); 3. Letters of reference (max 2), from university professors, scientific researchers or other experts in the field (art. 6 of the Call). |
| All qualifications must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|---------------------------|---|
| Appointed members | Riccardo Velasco – Director – Council for Research in Agriculture and Economics (CREA) Emanuele De Paoli – Associate Professor – Università degli Studi di Udine Rachele Falchi – Associate Professor – Università degli Studi di Udine |
| Substitute members | Paolo Sivillotti – Associate Professor – Università degli Studi di Udine Elisa Angelini – I° level Researcher – Council for Research in Agriculture and Economics (CREA) |

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

| Positions available: 1 | | | | |
|--------------------------------------|----|--|---------------------|---|
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| Positions WITH SCHOLARSHIP: 1 | 1 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2) | € 17,805.00 | 1. Applied biotech research in viticulture (New Genetic Techniques) to increase sustainability and resistance to |

TABLE 6 – PhD programme AGRICULTURAL SCIENCES AND BIOTECHNOLOGY

| Positions available: 1 | | | |
|------------------------|--|--|--|
| | | Investment/Subinvestment 3.3) and enterprise involved CUP G23C24001320005 | climate changes - Consorzio Agrario del Tirreno Soc. Coop * |

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR) and for positions marked with * after signing agreements with enterprises involved.

| Competition procedure and test schedule | | |
|---|---|--|
| Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. The applicant is admitted to the oral examination if his/her titles receive at least 21 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024. | | |
| Language that can be used for the exam | Italian or English | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae et studiorum | 10 |
| | Research project | 10 |
| | Scientific publications | 2 |
| | Thesis/Abstract | 6 |
| | Letters of reference | 2 |
| Oral examination | The oral examination is based on a discussion on the scientific titles submitted and includes an evaluation of English knowledge. | |
| Calendar of the oral examination | Date | September 6, 2024 |
| | Time | 09:00 AM (Italian time) |
| | Place | Department of Agricultural, Food, Environmental and Animal Sciences (DI4A), Bees room (B2-46) – via delle Scienze n. 206, 33100 Udine, ITALY |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
|--|
| <p>Research Topic 1 – Applying New Genetic Technologies (NGTs) to grapevine in order to improve sustainability and resilience to climate changes <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> Missione 2, green revolution and environment transition, regards at point M2C1 (Sustainable agronomy and Circular Ecology) as well as at point M2C4 (Saving territories and Water resources) two clear statements for environment protection coherent to the objectives of the PhD program. Particularly, sustainability in viticulture using modern biotechnological approaches to control biotic and abiotic stress that grapevine have to cope due to the climate changes need to be explored.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> Aims of the project are identified by different steps. Thanks to the experiences already existing at CREA Viticulture and Enology, several material is already available to apply NGTs. Such material includes grapevine plants (regenerated by embryogenic calli) from different genotypes, including rootstocks selected for resilience to water stress and also resistance to pathogens. First goal regards the characterization of such plants in controlled conditions to evaluate their answer to stress, then, after such experiments, will be possible to evaluate which strategies gave best results and replicate such experiments on novel genotypes of different regions. Finally, being such plants obtained through breeding process they will be analysed also for resistance to plant pathogens (Peronospora and oidium) and application to protocols to improve resilience will be set up.</p> <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> to be defined</p> <p><u>Period in enterprise (mandatory):</u> 6 months</p> <p><u>Enterprise data:</u> Consorzio Agrario del Tirreno Soc. Coop Roma Street n. 3, 58100 Grosseto (GR), Italy.</p> <p><u>Research activities to be carried out in the enterprise:</u> Activities in farms regards stages to learn physiology and phenology of grapevine in the fields, in particular regarding stress conditions and reaction to applied protocols. Conventional and biotechnological approaches will be compared to understand real opportunities to cope with climate changes and consequent solutions.</p> <p><u>Consistency of the doctoral program with the specific principles and obligations of the RNNP:</u></p> |

TABLE 6 – PhD programme AGRICULTURAL SCIENCES AND BIOTECHNOLOGY

The program is perfectly aligned with the specific interest of RNNP, in particular Mission 2 Green revolution and Ecological transition. The impact of the human being to the environment needs to be implemented to satisfy the goal of the cited Mission and the PhD program aims to the solution of some of these problems linked to the viticulture impact and higher sustainability.

Further, the program includes:

- All the activities respect priorities related to age, gender and territories.
- All the activities respect goals fixed by twin transition (green and digital)
- All the activities respect the principle of “no significative risk for the environment” (cd. DNSH) and all the other principles of the RNNP
- All the activities respect the principle of open science and open data, with guarantee that all data will be accessible, easy to be found, cross operable, and reusable.

Professor/researcher of reference:

Prof. Riccardo Velasco

TABLE 7 – PhD Programme MATHEMATICAL AND PHYSICAL SCIENCES

| THE PhD PROGRAMME | |
|--|--|
| Administrative location | University of Udine - Department of Mathematics, Computer Science and Physics (DMIF) – via delle Scienze 206, 33100 Udine, Italy (+39 0432 558400). |
| Associated location | - |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section “Description of research topics”. |
| Coordinator | Prof.ssa Roberta Musina (roberta.musina@uniud.it) |
| Programme duration | 3 years |
| Curriculum | - |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-physical-science-and-engineering/mathematical-and-physical-sciences/ph-d-programme/mathematical-and-physical-sciences?set_language=en https://www.dmif.uniud.it/dottorato/smf/ |

| ADMISSION REQUIREMENTS | |
|--|--|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

DOCUMENTS AND TITLES TO BE ATTACHED TO THE APPLICATION FOR ADMISSION

| | |
|--|--|
| Mandatory documents (Art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree); 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); |
| Optional documents (Art. 5 of the Call) | <ol style="list-style-type: none"> 1. Master thesis (“Tesi di Laurea”) associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call must submit an extended abstract in place of the complete thesis, in Italian or English, signed by the thesis Supervisor (between 15,000 and 25,000 characters, included spaces). 2. Research project, dated and signed, elaborated within the NRRP research topic indicated in this table (between 5,000 and 10,000 characters, included spaces, in English); 3. Motivation letter from the applicant explaining the reasons for admission to the PhD programme, dated and signed (between 1.500 and 2.500 characters, included spaces); 4. Publications (max 3); 5. Letters of reference (max 2) written by university professors, scientific researchers or other experts in the field (art. 6 of the Call). |
| All documents must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|--------------------------|--|
| Appointed Members | Enrico Bozzo - Assistant Professor - University of Udine Dimitri Breda – Associate Professor - University of Udine Davide Liessi - Assistant Professor - University of Udine |
| Alternate Members | Rossana Vermiglio – Full Professor - University of Udine |

ADMISSION

GENERAL COMPETITION (art. 9 of the Call for Applications)

| Positions available: 1 | | | | |
|--------------------------------------|----|---|---------------------|--|
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| Positions WITH SCHOLARSHIP: 1 | 1 | Ministerial Decree 629 of 24 April 2024 (NRRP Mission 4 Component 1 Investment/Subinvestment 4.1) – NRRP Research | € 17,805.00 | 1. Numerical and data-driven modeling for the dynamics of complex systems. |

TABLE 7 – PhD Programme MATHEMATICAL AND PHYSICAL SCIENCES

| | | |
|--|---------------------|--|
| | CUP G23C24001350003 | |
|--|---------------------|--|

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the Ministry of University and Research (MUR) have granted the funding.

| Competition procedure and test schedule | | |
|---|---|---|
| <p>Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills before the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. The applicant is admitted to the oral examination if his/her titles receive at least 15 points. The oral examination is passed with at least 49 points. The applicant is eligible for the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024.</p> | | |
| Language that can be used for the exam | Italian or English | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae et studiorum, Scientific publications, Reference letters | 12 |
| | Thesis/Abstract | 8 |
| | Research project and Motivation letter | 10 |
| Oral examination | Interview about titles, previous career and research project also aimed at understanding the applicant's knowledge about fundamental topics in mathematics and/or physics, as well as his or her full eligibility to receive a scholarship funded by external institutions. Reading and understanding a short scientific text in English. | |
| Calendar of the oral examination | Date | 5 September, 2024 |
| | Time | 9:00 AM (Italian time) |
| | How to conduct the examination | The oral examination will be held online. |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
|---|
| <p>Research Topic 1. - Numerical and data-driven modeling for the dynamics of complex systems. <i>Ministerial Decree 629 of April 24, 2024 (NRRP Mission 4 Component 1 Investment/Subinvestment 4.1) - NRPP Research</i></p> <p><u>Consistency of proposed research with NRRP areas of interest referred to in Article 7 c. 1 of Ministerial Decree 629/2024:</u> Starting from already available skills, the proposed research aims to implement new numerical-computational and data-driven methodologies for the investigation of the dynamics of mathematical models suitable for describing the evolution of complex systems governed by functional equations (integro-differential, partial derivatives, etc.), also stochastic. The application fields of interest range from the bio-mathematical field of population dynamics to the control theory of engineering systems and processes. The final objective is to provide efficient and suitable computational and data-driven tools for use in modeling and applications (e.g.: epidemiological investigations, control of production processes, technologies for automatic vehicle driving). Involving approaches in the area of machine learning and of a distinctly computational nature, the topic falls well within various areas of NRRP interest, including</p> <ul style="list-style-type: none"> • M1C2: DIGITALIZATION, INNOVATION AND COMPETITIVENESS IN THE PRODUCTION SYSTEM (applications to the control of production systems and for sustainable innovation) • M6C2: INNOVATION, RESEARCH AND DIGITALIZATION OF THE NATIONAL HEALTH SERVICE (applications in the biological and epidemiological field) and in general also in • MISSION 3: INFRASTRUCTURES FOR SUSTAINABLE MOBILITY (applications in the field of automatic driving). <p>The proposed line of research is naturally presented as interdisciplinary, both within the mathematical area itself (requiring skills in nonlinear, functional, numerical-computational and optimization analysis) and outside the latter, having to interface also with computational aspects in the field of emerging machine learning and modeling methodologies for reference applications, also making use of modern approaches typical of systems biology. Furthermore, the project is intersectoral in nature, based on indispensable and fruitful interactions with the areas of bio-mathematics and controls in general. Finally, the proposing research group has long been part of a network of international collaborations which boasts among its members leading centers both in the mathematical field and in that of related applications in the biological and control fields (Ann Arbor, Budapest, Girona, Leeds, Leuven, Paris, Toronto, Trento, among others), constitutes a local unit of the PRIN 2020 project (No. 2020JLWP23) "Integrated Mathematical Approaches to Socio-Epidemiological Dynamics" (CUP: E15F21005420006) and is the owner of the collaborative research project DM737 "MONDI Numerical and Data-driven Modeling for Sustainable Innovation" with partners University of L'Aquila and University of Salerno. Objectives and expected results, proposed research activity, methodologies and content:</p> <p>This project proposal has a dual objective: on the one hand, the analytical-numerical-computational study of new approaches, including data-driven ones, to modeling that can effectively reconstruct and describe the evolution of complex systems that can be used to e.g. for the spread of an epidemic or for the automatic control of production or engineering systems in general; on the other, the translation of this study into easily usable computational tools available to professionals in the contexts of interest, as effective means of monitoring, forecasting and planning. The doctoral path aims to train a young person in high-level interdisciplinary, intersectoral and international research who can then continuously contribute to innovation in those areas where mathematics can interact with the more applied sciences, producing at the end of the three-year period software prototypes that can serve as the basis for further future developments. The results will be intended for publication in international journals of recognized value, from an "Open science" and "FAIR Data" perspective, as well as being presented at the most important conferences in both the mathematical and applied fields. The methodologies used will range from theoretical-modeling analysis to numerical study and implementation, accompanied by adequate calibration, training, simulation and validation phases. The context offers numerous opportunities for in-depth</p> |

TABLE 7 – PhD Programme MATHEMATICAL AND PHYSICAL SCIENCES

study of different research directions, also strategically directed according to the characteristics of the candidate who will be suitable, thus enriching the innovation potential of the proposed topic. The contents on which to apply what has been described may concern mathematical models of population dynamics or control problems, to be developed on the basis of the most recent literature and in which to insert or adapt a computational and data-driven approach.

Period abroad (mandatory): 6 months

Foreign host entity data: to be defined

Consistency of the doctoral program with the specific principles and obligations of the RNNP:

Transversal priorities: this proposal is consistent with the transversal priority of the NRRP which concerns young people in Italy, as education, training and subsequent employment opportunities are one of the main objectives.

Twin transitions (green and digital): this proposal contributes to digitalization through the creation of computational tools that can be used by the biomedical-health sector.

Do Not Cause Significant Harm – DNSH: This proposal does not cause any harm to the environment.

Open science and FAIR Data: the results obtained within the scope of this proposal will be immediately made available with open access to the public and published in international journals (if possible, also in open access mode), according to the "Open science" and "FAIR DATA" principles.

Professor/researcher of reference:

Prof. Dimitri Breda

TABLE 8 – PhD Programme in CLINICAL AND TRANSLATIONAL MEDICAL SCIENCES

| THE PhD PROGRAMME | |
|--|---|
| Administrative location | University of Udine, Department of Medical Area (DAME) –via Colugna 50, 33100 Udine, ITALY (tel. +39 0432 494301). |
| Associated location | |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section “Description of research topics”. |
| Coordinator | Prof. Giuseppe Damante (giuseppe.damante@uniud.it) |
| Programme duration | 3 years |
| Curriculum | - |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-life-science/scienze-mediche-cliniche-e-traslazionali/ph-d-programme/eng-scienze-mediche-cliniche-e-traslazionali?set_language=en |

| ADMISSION REQUIREMENTS | |
|--|---|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | English |

| DOCUMENTS AND TITLES TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|---|--|
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree). 2. Curriculum vitae et studiorum, dated and signed; 3. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 4. Development of the research topic indicated in this sheet. |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Publications on impact factor journals (max 2); 2. Letters of reference (max 2) written by university professors, scientific researchers or other experts in the field (art. 6 of the Call). |
| All titles must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|---------------------------|---|
| Appointed Members | Giuseppe Damante – Full Professor – University of Udine Matteo Balestrieri – Full Professor – University of Udine Alvisa Palese – Full Professor – University of Udine |
| Substitute Members | Bruno Grassi – Full Professor – University of Udine Stefano Lazzer – Associate Professor – University of Udine Piercamillo Parodi - Associate Professor – University of Udine Maria Parpinel - Associate Professor – University of Udine |

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

| Positions available: 1 | | | | |
|--------------------------------------|----|---|---------------------|---|
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| Positions WITH SCHOLARSHIP: 1 | 1 | Ministerial Decree 630 of 24 April 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3) and enterprise involved CUP G23C24001330005 | € 17,805.00 | 1. Friulian citizens against Parkinson's disease: diagnostic-therapeutic alliance between the territory, healthcare professionals and new technologies (Frico-Plus) - Azienda Sanitaria Universitaria Friuli Centrale (ASUFC) |

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR).

| Competition procedure and test schedule |
|--|
| Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills to tackle the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. Applicant is admitted to the oral examination if his/her titles receive at least 15 points. The oral examination is passed with at least 49 |

TABLE 8 – PhD Programme in CLINICAL AND TRANSLATIONAL MEDICAL SCIENCES

| | | |
|---|---|--|
| <p>points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024.</p> | | |
| Foreign language that can be used for examination | Italian or English | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae and studiorum | 10 |
| | Scientific publications | 4 |
| | Letters of reference | 2 |
| | Development of the research topic indicated in this sheet | 14 |
| Oral examination | Part of the oral examination will be in English. | |
| Calendar of the oral examination | Date | September 5, 2024 |
| | Time | 10.00 AM (Italian time) |
| | Place | Department of Medicine (DMED), Room B – Piazzale Kolbe 4, 33100 Udine ITALY |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
|--|
| <p>Research Topic 1 - Friulian citizens against Parkinson's disease: diagnostic-therapeutic alliance between the territory, healthcare professionals and new technologies (Frico-Plus) <i>Ministerial Decree 630 of April 24, 2024 (NRRP Mission 4 Component 2 Investment/Subinvestment 3.3)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> The project aims to meet the needs of the population affected by neurodegenerative diseases in the territory in an innovative way, even and especially in traditionally more geographically remote realities and where patient care services are less accessible. This care will be implemented by means of the most advanced and up-to-date instrumental and laboratory technologies, used for the purposes of biological characterisation, diagnosis and follow up of the individual suffering from neurodegenerative disease, considered in his or her territorial context and in its fragile complexity.</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> According to ISTAT data, in the Friuli Venezia Giulia region there were 321,370 elderly people over 65 as of 1 January 2023, or 26.9 per cent of the population. In some inland territories, including Carnia and the Gemona area, the elderly population is about three times that of the under-15s, while the regional old-age index stands at 237.2, which is higher than the national figure of 193.1. In the context of a Region with an increasingly elderly population, one of the greatest health challenges concerns the prevention and treatment of neurodegenerative diseases, which are directly related to the ageing process. In this region, the number of patients suffering from Alzheimer's disease, the most frequent form of dementia, reaches 20,000, while patients suffering from Parkinson's disease number about 6,000. The doctoral project aims to make operational a service for taking charge of patients suffering from neurodegenerative pathologies, especially Parkinson's disease, through the implementation of diagnosis and care pathways in the area of the person's home region, intervening in particular in the areas with the highest prevalence of advanced age (the main risk factor for these pathologies), including Alto Friuli area.</p> <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> Department of Human Genetics, McGill University Montreal (QC), Canada</p> <p><u>Period in enterprise (mandatory):</u> 18 months</p> <p><u>Enterprise data:</u> Azienda Sanitaria Universitaria Friuli Centrale (ASUFC) Pozzuolo Street n. 330, 33100 Udine (UD), Italy</p> <p><u>Research activities to be carried out in the enterprise:</u> Research into liquid and serum markers of protein misfolding for early analysis of neurodegenerative pathology; genetic analysis of patients with Parkinson's disease with a probable hereditary-familial aetiology; use of nutraceuticals for the management of motor and non-motor (in particular, cognitive) symptoms of neurodegenerative syndromes.</p> <p><u>Consistency of the doctoral program with the specific principles and obligations of the RNNP:</u> The doctoral programme is consistent with the principles and specific obligations of the RNNP with regard to the principle of 'Do No Significant Harm' (DNSH) and the principles of Digital Tagging, Gender Equality and Overcoming Territorial Gaps.</p> <p><u>Professor/researcher of reference:</u> Prof.ssa Mariarosaria Valente</p> |

TABLE 10 – PhD Programme in ART HISTORY, FILM STUDIES, MEDIA STUDIES AND MUSIC

| THE PhD PROGRAMME | |
|--|--|
| Administrative location | University of Udine, Department of Humanities and Cultural Heritage (DIUM) - vicolo Florio 2, 33100 Udine (+39 0432 556100) |
| Associated location | - |
| Location for training, teaching and research activity | Teaching and other training activities will take place primarily at the administrative programme location or in other locations of the University of Udine. The research programme will be developed according to the section "Description of research topics". |
| Coordinator | Prof. Alessandro Del Puppo (alessandro.delpuppo@uniud.it) |
| Programme duration | 3 years |
| Curricula | 1. Art History 2. Film Studies, Media Studies, Musicology |
| Programme website | https://www.uniud.it/en/research/do-research/doctorate-res/our-ph-d-programmes/area-social-science-and-humanities/art-history-film-studies-media-studies-and-music/ph-d-programme/art-history-film-studies-media-studies-and-music?set_language=en https://dium.uniud.it/en/didattica/corsi-di-studio/dottorati-di-ricerca/storia-dellarte-cinema-media-audiovisivi-e-musica/ |

| ADMISSION REQUIREMENTS | |
|--|---|
| Required degree | Italian Laurea (before DM 509/99) or Italian Laurea specialistica/magistrale (ex DM 509/1999 and DM 270/04) or equivalent degree obtained abroad. Foreign degrees and titles: refer to art. 3 and 4 of the Call. |
| Knowledge of the following foreign language | One of the following: English, French, German, Spanish |

| DOCUMENTS AND QUALIFICATIONS TO BE ATTACHED TO THE APPLICATION FOR ADMISSION | |
|---|--|
| Mandatory documents (art. 5 of the Call) UNDER PENALTY OF EXCLUSION | <ol style="list-style-type: none"> 1. Certification or self-certification (pursuant to art. 5 c. 5 of the Call) of the academic qualification for admission to the doctoral program (Italian Laurea Specialistica/Magistrale or Italian Laurea before DM 509/99 or foreign degree); 2. Master thesis ("Tesi di Laurea") associated to the degree/title providing access to the PhD programme. Applicants who are not graduated on the expiration date of this Call must submit an extended abstract in place of the complete thesis, in Italian or English, signed by themselves and by their thesis Supervisor (approximate limit 25,000 characters, included spaces); 3. Curriculum vitae et studiorum, dated and signed; 4. Copy of a valid identity document (citizens of countries not belonging to the European Union a copy of a valid passport, comprehensive of the pages containing the holder's photo, personal details, passport number, date and place of issue, date of expiry); 5. A research prospect, dated and signed, developed within the PNRR topics indicated in this form (up to 20,000 characters-long, including spaces, in Italian/English). The submitted project should identify one aspect consistent with the themes of the grant (technologies for Virtual Production) and profile an area of intervention and research experimentation/application by detailing: <ol style="list-style-type: none"> 1. - Theoretical-methodological frameworks and literature; 2. - Research timeline. 3. - Objectives and Achievable Outcomes/Results. |
| Optional documents (art. 5 of the Call) | <ol style="list-style-type: none"> 1. Motivation letter by which the applicant explains the reasons for admission to the PhD programme, dated and signed (approximate limit 2,500 characters, included spaces); 2. Publications (max 5). |
| All qualifications must be submitted exclusively in PDF format, dated and signed by the candidate. | |

| SELECTION COMMITTEE | |
|---------------------------|---|
| Appointed members | Simone Dotto – Researcher – University of Udine Andrea Mariani – Researcher – University of Udine Simone Venturini – Full professor - University of Udine |
| Substitute members | Luca Pietro Nicoletti – Associate professor – University of Udine Mariapia Comand – Full professor – University of Udine |

ADMISSION

GENERAL COMPETITION (art. 8 of the Call for Applications)

| Positions available: 1 | | | | |
|------------------------|----|---------|---------------------|----------------|
| Detailed description | N. | Funding | Annual gross amount | Research topic |
| | | | | |

TABLE 10 – PhD Programme in ART HISTORY, FILM STUDIES, MEDIA STUDIES AND MUSIC

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|--------------------------------------|----------|--|-------------|---|
| Positions WITH SCHOLARSHIP: 1 | 1 | Ministerial Decree 629 of 24 April 2024 (NRRP Mission 4 Component 1 Investment/Subinvestment 3.4) - Digital and environmental transition CUP G23C24001340007 | € 16,243.00 | 1. Towards the Virtual Studio. Protocols and practices for experimental research on OSVP (On-Set Virtual Production) technologies for educational and professional use. |
|--------------------------------------|----------|--|-------------|---|

As per Art. 1 c. 2 of the call for applications, positions with scholarships will start only after the funding has been granted by the Ministry of University and Research (MUR).

| Competition procedure and test schedule | | |
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| <p>Evaluation of qualifications and oral examination. For the evaluation of applicants' attitude for scientific research and their basic skills before the course program, the Selection Committee can attribute up to 100 points to each applicant: max 30 points to the titles and max 70 points to the oral examination. Applicant is admitted to the oral examination if his/her titles receive at least 21 points. The oral examination is passed with at least 49 points. The applicant is eligible to the PhD programme if he/she passes the oral examination. Only for eligible applicants, the points attained in the oral examination will be added to the points of the titles. DATE FOR THE PUBLICATION OF ADMITTED APPLICANTS TO THE INTERVIEW: within August 30, 2024. DATE FOR THE PUBLICATION OF THE FINAL RANKING LIST: within September 9, 2024.</p> | | |
| Foreign language that can be used for examination | Italian, English and/or French | |
| Evaluation Criteria of qualifications <i>During the preliminary meeting the Selection Committee may establish sub-criteria for the evaluation</i> | Curriculum vitae et studiorum | 8 |
| | Research project | 10 |
| | Scientific publications | 3 |
| | Thesis/Abstract | 8 |
| | Motivational letter for admission to the PhD programme | 1 |
| Oral examination | The oral examination aims at verifying the research skills of the applicants, with particular reference to the research project. | |
| Calendar of the oral examination | Date | September 4th, 2024 |
| | Time | 10:00 AM (Italian time) |
| | Location | Online – Microsoft Teams |
| | Based on the number of applicants, the oral examination may take place in more than one day. To attend the examination tests, the candidates must exhibit a valid identity document or other personal identification document (possibly the same document attached to the application), under penalty of exclusion from the selection procedure. Citizens of non-EU states must mandatorily exhibit their passport. | |

| Description of research topics |
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| <p>Research Topic 1 - Towards the Virtual Studio. Protocols and practices for experimental research on OSVP (On-Set Virtual Production) technologies for educational and professional use <i>Ministerial Decree 629 of April 24, 2024 (NRRP Mission 4 Component 1 Investment/Subinvestment 3.4 - Digital and environmental transition)</i></p> <p><u>Consistency of proposed research with NRRP areas of interest:</u> In promoting the development of advanced technical-scientific skills relating to the use of 'virtual production' tools, the proposed research is consistent with PNRR Mission 1 (Digitalisation, Innovation, Competitiveness: Culture and Tourism), and in particular with Components 2 (Digitalisation, Innovation, Competitiveness in the Production System) and 3 (Tourism and Culture). The implementation of cutting-edge competences within the university structures aims at making the departmental infrastructures - and in particular the Polo Media Lab - a reference outpost for small and medium-sized local companies active in the film and audiovisual production sector. In addition to this, a significant part of the investments envisaged by the same NRRP to increase competitiveness and the rate of innovation in the creative industries was specifically aimed at the development of 'virtual production set' infrastructures for professional and educational use in Cinecittà facilities (M1C3.1: Film Industry Development). The development of skills related to new technologies is also subtended to experiment, promote and institute good practices that relocate the different processing phases (production and post-production) in a well-equipped studio, thus significantly decreasing the environmental impact of audiovisual production in terms of energy consumption, outdoor set-up, transport, etc. In this sense, the proposed research is consistent with what is planned by the PNRR in Mission 2 (Green Revolution and Ecological Transition): more specifically, it intends to align itself with the investment logic for Components 1 (development of Integrated Projects for the dissemination of culture and awareness on environmental issues and challenges) and 4 (contributing to the growth of an innovation ecosystem with a focus on green transition).</p> <p><u>Objectives and expected results, proposed research activity, methodologies and content:</u> The main objectives of the proposed research are the acquisition, transmission and dissemination of knowledge and skills related to the use of emerging OSVP (On Set Virtual Production) technologies. Under this acronym we intend to indicate a set of technological devices (LED screens, virtual cameras), technical skills (motion capture, compositing, CGI, 3D modelling) and software components (UnReal Engine, 3D Photoshop, Real Time) that enable the elaboration of sets and visual effects in real time during the production phase. The following sub-objectives will contribute to the achievement of these objectives:</p> <ol style="list-style-type: none"> 1. General survey on the dissemination and use of OSVP technologies in contemporary film and television production centres, with a focus on training and refresher programmes for operators (Year I). 2. Experimental and applied research in the spaces and technological equipment currently at the Polo Media Lab (I - II year) and at foreign research centres and affiliated institutes (II - III year). 3. Development of a protocol for the sustainable and inclusive use of hardware and software technologies in the laboratory facilities for professional and educational use (3rd year). |

TABLE 10 – PhD Programme in ART HISTORY, FILM STUDIES, MEDIA STUDIES AND MUSIC

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| <p>4. Contributions to international scientific conferences and publication of 1 article in peer-reviewed Anvur band A journals in Open Access mode (3rd year).</p> <p>Already employed in the most advanced sectors of the film and television industry, OSVP technologies are gradually eroding the boundaries between the different phases of the traditional audiovisual supply chain (pre-production, production and post-production). The PhD scholarship holder will be asked to reflect on the implications of their use with regard to:</p> <ul style="list-style-type: none"> A. the creative possibilities and aesthetic solutions they import into contemporary audiovisual production; B. the accelerated workflow and the gap they create between new and old professionals involved in national film and television productions; C. the economic and ecological dimension - i.e., the impact on the costs of and the environmental sustainability of small and medium-sized film productions. <p>Focusing on these thematic aspects, the proposed research is innervated by a methodological framework that privileges a "practice-based" dimension (acquisition of knowledge through production practice and experimentation on the technologies provided). Further investigative tools will draw on the strand of media industry studies and cultural studies on production (participant observation and collection of professionals' testimonies) and on the most up-to-date instances of eco-critical and eco-materialist research on media production (for the verification of the environmental impact and the prospect of good practices to be included in the final protocol). On the basis of these thematic aspects, the proposed research is innervated by a methodological framework that privileges a 'practice-based' dimension (acquisition of knowledge through production practice and experimentation with the technologies at hand). Further investigative tools will draw on the strand of media industry studies and cultural studies on production (participant observation and collection of professionals' testimonies) and on the most up-to-date instances of eco-critical and eco-materialist research on media production (for the verification of the environmental impact and the prospect of good practices to be included in the final protocol). During the study period, the scholarship holder will be able to make use of the hardware and software tools already available at the aforementioned Media Lab of the University of Udine and at the foreign company and university involved in the research programme - both of which specialise in the field of Virtual Production in the educational and professional field. The knowledge acquired during the course can be applied, still on an experimental basis, to support the practical-laboratory courses already included in the DAMS three-year degree course (Audiovisual Design and Production; Audiovisual and Multimedia Post-Production and Distribution; Animation, Comics and Graphics) and the Master's degree course in Audiovisual Heritage and Media Education (Storytelling; Smart Film-making; Executive Media Production; Exhibition Design and Digital Curatorship).</p> <p><u>Period abroad (mandatory):</u> 6 months</p> <p><u>Foreign host entity data:</u> V/R Academy Netherlands Film Academy Markenplein 1 1011 MV Amsterdam, The Netherlands https://www.filmacademie.ahk.nl/en/netherlands-film-academy/vracademy/contact/</p> <p><u>Enterprise data research centres or PA, including museums, institutes of the Ministry of Culture, archives, host libraries:</u> Istituto Luce srl – Cinecittà Tuscolana Street n. 1055, 00173 Roma (RM), Italy https://cinecitta.com/studios/servizi/virtual-production/</p> <p><u>Research activities to be carried out in the enterprise:</u> During the period spent at the hosting Institution, the PhD scholarship holder will deepen his/her knowledge of the use of OSVP technologies in both the educational and professional spheres. Cinecittà is in fact the first recipient of PNRR funding for the extension of Virtual Production structures and skills and currently hosts the T18 Led Volume Stage at the service of professional productions. In addition, the training activities promoted by LuceLAB Cinecittà include an annual Virtual Production training service for students and professionals. The company will co-operate with the scientific heads of the doctoral research in the definition of the training course and will be a privileged professional interlocutor to probe the changes in the workflow and the impact at economic and environmental level.</p> <p><u>Consistency of the doctoral program with the specific principles and obligations of the RNNP:</u></p> <ul style="list-style-type: none"> a) Transversal priorities: The proposed research is in line with the initiatives envisaged for transversal priority 4.1 ('Youth'), in particular in the areas of promoting youth employment and enhancing vocational training, and reducing the gap between education and work. By hypothesising a "hybrid" pathway between university and vocational training, involving both an academic institution and an entrepreneurial entity, the project intends to tailor the skills acquired during doctoral studies to the professional needs currently most in demand in audiovisual production, thus facilitating a direct entry into the world of work. b) Twin Transitions: As already explained above, with respect to the digital transition, the proposed research is consistent with the PNRR points of Mission 1 (Digitisation, Innovation, Competitiveness: Culture and Tourism), and Components 2 (Digitisation, Innovation, Competitiveness in the Production System) and 3 (Tourism and Culture), with particular reference to the investment (M1C3.1: Film Industry Development). As for the ecological transition, it adheres to Mission 2 (Green Revolution and Ecological Transition) in Components 1 (Development of Integrated Projects for the dissemination of culture and awareness on environmental issues and challenges) and 4 (Contributing to the growth of an innovation ecosystem with a focus on green transition). c) do not cause significant harm - DNSH: The research activities fulfil the criteria of minimal/not significant impact according to the DNSH principles applied to Mission 1 - "Digitisation, Innovation, Competitiveness: Culture and Tourism" (investments in upgrading and training) and to Mission 4 - Component 1 "Education and Research" (investments in technology transition, training in digital tools). d) Open science and FAIR Data: the survey of research on the use of OSVP technologies in contemporary audiovisual production and considerations on their environmental and technological impact will be made publicly accessible in the course of the research and, in a final form, with the publication of scientific articles in Open Access mode. The protocol for the use of OSVP technologies created downstream of the doctoral research will first be shared with the industrial and institutional subjects directly involved in the research phase and finally published on the web to facilitate its consultation and re-use by the companies in the sector operating in the area. |
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TABLE 10 – PhD Programme in ART HISTORY, FILM STUDIES, MEDIA STUDIES AND MUSIC

Professor/researcher of reference:
Prof. Simone Dotto