



**UNIVERSITÀ DEGLI STUDI
DI CAGLIARI**

Dipartimento di Ingegneria Elettrica ed Elettronica
Direttore: Prof. Luigi Atzori



HR EXCELLENCE IN RESEARCH

Call n. 1/2026 for the assignment of n. 5 four-months Scholarships to encourage, through training courses, the enrollment of second-cycle students in PhD programmes delivered by the DIEE

DIEE Project of Excellence - UNICA funded by the MUR Notice of Departments of Excellence 2023-2027 (l. 232/2016, art. 1, paragraphs 314 – 337) CUP F23C23000060001

PREMISES

University of Cagliari, with more than 400 years of history, 25,000 students, 51 undergraduate programmes, 44 master's degrees, 40 graduate schools, 18 PhD programmes, 5 active masters, member of the "European Digital UniverCity" (EDUC) Alliance and boasts two Departments of Excellence.

The Department of Electrical and Electronic Engineering (DIEE) is the reference department for the PhD programme in Electronic and Computer Engineering ([PhD Program in Electronics and Computer Engineering](#)) and, with another department of the University of Cagliari, is the reference for the PhD programme in Industrial Engineering ([PhD Program in Industrial Engineering](#)). In recent years, DIEE professors were proposers of the university membership to several PhD programmes of national interest recently established.

DIEE has been recognized by the Ministry of Universities and Research, as Department of Excellence 2023-2027, and has identified as excellence project's driving theme the "Human-centered, resource-efficient systems" (HC-RES), with specific application to the themes of energy transition, environment and health.

ART. 1 - PURPOSE AND SUBJECT OF THE CALL

One of the objectives of the higher qualification teaching activities of the DIEE Excellence project, funded by the MUR with Notice of Excellence Departments 2023-2027 (l. 232/2016, art. 1, paragraphs 314 - 337), is to connect the training paths of master's degree programmes



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DIPARTIMENTO DI INGEGNERIA ELETTRICA ED ELETTRONICA

DIPARTIMENTO DI ECCELLENZA MUR 2023-2027



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to PhD programmes, encouraging the start of research for master students interested in a doctoral programme.

In this framework, a call is launched for the award of no. 5 four-months SCHOLARSHIPS.

The activities of scholarship holders will be carried out at the DIEE in Cagliari, to allow students to start their four-months study programme, on the topics developed in the doctoral programmes delivered by DIEE, supported by other equivalent initiatives in contexts of proven international relevance (see [EDUC](#)).

The training activities will focus on the following topics:

Scholarship n. 1/2026	Scientific Coordinator Prof. Andrea Giovanni Casula
Title	Study of RF devices using cutting-edge 2D materials for applications in 5G/6G ICT and IoT
Duration	four months
Topic	<p>The activity focuses on the advanced electromagnetic modeling and design of Radio Frequency (RF) devices integrating next-generation 2D materials, such as graphene. The primary objective is to leverage numerical simulations to explore new technological frontiers essential for 5G/6G networks and the Internet of Things (IoT), where increasingly miniaturized and high-performance components are required.</p> <p>The core of the work involves the use of CST Microwave Studio to create accurate numerical models capable of describing the electromagnetic behavior of 2D materials. Through full-wave analysis, the activity will focus on the optimization of antennas and reconfigurable circuits, investigating how variations in the surface properties of these innovative materials (such as graphene conductivity</p>



	<p>via electrical bias) can modulate device response in terms of frequency, gain, and radiation patterns.</p> <p>Ultimately, the activity aims to establish cutting-edge design guidelines through virtual prototyping, enabling the precise prediction of the effectiveness of sustainable, high-performance technological solutions for the connectivity of the future.</p>
<p>Courses and seminars organized by a PhD program and by other institutions of proven scientific value based in Sardinia;</p>	<p>Participation in advanced courses, thematic schools, and scientific seminars organized within PhD programmes.</p> <p>The training activities will cover electromagnetic modeling methodologies, RF and microwave device design and characterization, full-wave numerical simulation techniques, experimental data analysis, and the development of innovative technological solutions for 5G/6G and IoT applications.</p> <p>These seminars will also provide transversal skills in research management, scientific communication, and technology transfer.</p>
<p>Study of one or more topics within the framework of the curricular courses of the DIEE PhD programmes, under the supervision of the Scientific Coordinator</p>	<p>The student will focus his activity on the analysis and design of radiofrequency devices integrating innovative 2D materials.</p>
<p>Attendance of DIEE laboratories</p>	<p>The student will attend the Antennas and Microwaves laboratory to carry out the activities required by the study program as reported in the above-mentioned point 2.</p>



Scholarship n. 2/2026	Scientific Coordinator Dr. Giulia Sedda
Title	Study of the electromyographic signal applied as biofeedback in contexts of upper limb motor adaptation.
Duration	four months
Topic	The objective of this fellowship is to investigate the use of the electromyographic (EMG) signal within upper-limb motor adaptation protocols. The focus will be on EMG-based biofeedback applications aimed at promoting motor learning, both in pure motor-adaptation settings and in rehabilitation contexts, with particular attention to fixed and adaptive thresholding methods and algorithms.
Courses and seminars organized by a PhD program and by other institutions of proven scientific value based in Sardinia;	The student will have access to relevant courses and seminars offered by DRIEI and CRS4, with particular emphasis on those in the areas of information bioengineering and computer science/artificial intelligence.
Study of one or more topics within the framework of the curricular courses of the DIEE PhD programmes, under the supervision of the Scientific Coordinator	The student will deepen their understanding of information bioengineering and computer science.
Attendance of DIEE laboratories	The student will be required to attend the MeDSP Lab, working alongside researchers, research fellows, and PhD candidates as part of a hands-on training pathway in the field of neurorehabilitation.



Scholarship n. 3/2026	Scientific Coordinator Dr. Claudio Marche
Title	Development of a Digital Twin prototype for IoT systems in an Edge-Cloud architecture.
Duration	four months
Topic	<p>In IoT systems, devices and sensors enable monitoring and controlling the environment, while the Digital Twin represents an advanced digital counterpart of the physical entity and its processes, capable not only of keeping the state aligned through continuous updates, but also of supporting analysis, optimization, and decision-making through the availability of data, rules, and behavioural models. The research grant activity focuses on studying and defining the elements required to design Digital Twins for IoT environments, starting from requirements analysis. In particular, the work begins with the analysis and definition of a use case, events, and data flows, with specific attention to update timing constraints. Based on these specifications, a working proof-of-concept is developed in a smart home scenario, where multiple entities are represented by Digital Twins and kept consistent with the state observed from physical devices. System behaviour verification criteria will be applied, including the handling of concurrent updates and the resolution of potential state conflicts, together with an experimental validation based on integration tests in a real environment.</p>
Courses and seminars organized by a PhD program and by other institutions of	The student will attend one seminar selected from those offered by PhD programs and other institutions of



proven scientific value based in Sardinia;	recognized scientific standing legally based in Sardinia, consistent with the defined training pathway.
Study of one or more topics within the framework of the curricular courses of the DIEE PhD programmes, under the supervision of the Scientific Coordinator	The student will carry out an in-depth study on one or more selected topics within the core courses of the DIEE PhD programs, under the supervision of the Scientific Coordinator.
Attendance of DIEE laboratories	The student will attend the DIEE laboratories and take part in practical activities aligned with their study plan, aimed at acquiring research-relevant skills.

Scholarship n. 4/2026	Scientific Coordinator Prof. Alessandro Fanti
Title	AI-Driven RF/MW Modeling for Integrated Sensing and Communication.
Duration	four months
Topic	Study activity focused on the modeling of RF and microwave signals for integrated sensing and communication systems. The objective is to analyze waveforms, channels, and performance metrics of various communication systems, including radar, by applying advanced Machine Learning and AI techniques for feature extraction, classification, and performance optimization. The activity includes practical exercises on simulation and analysis of real or synthetic signals.



Courses and seminars organized by a PhD program and by other institutions of proven scientific value based in Sardinia;	The student will attend courses and seminars selected from those offered by the DRIEI and the PhD Program in Industrial Engineering, in accordance with the chosen study pathway.
Study of one or more topics within the framework of the curricular courses of the DIEE PhD programmes, under the supervision of the Scientific Coordinator	The student will study the modeling of RF and microwave signals in integrated sensing and communication systems. The activity may focus on analyzing channel models and waveforms, exploring how Machine Learning and AI techniques can enhance parameter estimation, feature extraction, and overall system performance.
Attendance of DIEE laboratories	The student will attend the Applied Electromagnetics Laboratory to carry out the activities required by the study program.

Scholarship n. 5/2026	Scientific Coordinator Prof. Battista Biggio
Title	Adversarial Machine Learning.
Duration	four months
Topic	The beneficiary will study techniques regarding adversarial automatic opening. In particular, those related to the optimization of attacks necessary for the evaluation of the robustness of a system.
Courses and seminars organized by a PhD program and by other institutions of proven scientific value based in Sardinia;	The student will take the course of “Deep Learning and Computer Vision with PyTorch” and other curricular courses of the “PhD Course in Electronic and Computer Engineering (DRIEI)” aimed at deepening knowledge on artificial intelligence techniques.



Study of one or more topics within the framework of the curricular courses of the DIEE PhD programmes, under the supervision of the Scientific Coordinator	The student will delve into the topics of Deep Learning and Computer Vision.
Attendance of DIEE laboratories	The student will attend and be involved in the activities of the Adversarial Machine Learning Unit of the sAlfer Lab laboratory at DIEE.

The educational activities of the training programmes, defined in agreement with the Scientific Coordinators, will cover:

1. Courses and seminars organized by a PhD programme and other institutions of high scientific value with registered office in Sardinia;
2. Study of one or more topics within the framework of the curricular courses of the DIEE PhD programmes, under the supervision of the Scientific Coordinator.
3. Attendance of DIEE laboratories.
4. Study programme with the support of the Research Units of the Department, under the supervision of the Scientific Coordinator.

Art. 2 DURATION AND VALUE OF THE FUNDING

Each grant is awarded for a period of four months, in accordance with the procedures set out in art. 1 of the call. The winners will perform the activity at the DIEE.

Each scholarship has a maximum amount of € 4,608.29 gross grant holder and, pursuant to art. 50, paragraph c of the TUIR, is considered income equivalent to employee work and therefore subject to statutory deductions from the scholarship holder.



The scholarship will be paid in deferred monthly payments. The scholarship is financed by funds of the DIEE - UNICA Excellence Project funded by the MUR Notice Departments of Excellence 2023-2027 (Law n. 232/2016, art. 1, paragraph 314 - 337).

The grant is not cumulative with other grants or allowances of a similar nature. It may not be combined with salaries or remuneration arising from public or private employment relationships.

Art. 3 - Eligibility requirements

3.1 Admission to selection is open to students, without limits of citizenship, holding the following requirements at the deadline of the competition:

- if not enrolled in a single cycle degree course:

- have obtained the Bachelor degree (three-years) no more than five years before the application, at any Italian or foreign university recognized in Italy by the Ministry of University and Research, and
- be enrolled in the academic year 2025/2026, at the time of application and for the duration of the scholarship, in a Master's degree course according to the Italian Ministerial Decree no. 270/2004 (laurea magistrale);

-if enrolled in a single cycle degree course, be enrolled in the fourth or fifth year or subsequent years in any Italian university.

- if enrolled in a foreign university, be enrolled in the last two years or subsequent years of a single-cycle course or in second-cycle course; these courses must provide a suitable academic title, equivalent, in terms of duration, level of degree and fields of study to the degrees listed above, providing access to PhD programs in the awarding country.

- if not Italian citizen, have suitable knowledge of Italian or English language, level B2.

In the case of a foreign degree obtained (first cycle) or to be obtained (second or single cycle), the candidate must submit detailed documentation of the training course and its translation into Italian or English, to enable the Commission to declare their equivalence for the sole purpose of participation in the above-mentioned call (Annex B).



If the foreign degree has already been declared equivalent to an Italian degree, the candidate will report the reference of the University that recognised the equivalence and the number of the Rector's decree declaring the equivalence.

3.2 For the admission to the call, in addition to the requirements mentioned in art. 3.1, if the candidate is not an Italian/European Union citizen and if he/she is resident in Italy or in the European Union, he/she must comply with the current provisions on entry and residence.

The eligibility criteria must be met and declared by the deadline for submission of applications. Applicants are admitted conditionally. Exclusion from the selection may be ordered at any time, with reasoned provision of the Head of the Department of Electrical and Electronic Engineering, for failure to meet the prescribed access requirements, for irremediable irregularities in documentation, for failure to comply with the rules for sending applications or late submission.

Art. 4 - SUBMISSION OF APPLICATIONS, TERMS AND CONDITIONS

The applications, up TYPED according to the scheme annexed to this notice (Annexes No. 1, A and B), signed by the candidate, **must be sent** to the Administrative Secretariat of DIEE, **at the e-mail address: scholarship.diee@unica.it , within 18th march 2026 at 13:00 Central European Time (CET), under penalty of exclusion.**

Before submitting your application, we recommend that you activate the options "Request delivery confirmation" and "Request read confirmation", in your e-mail box.

The e-mail message must indicate in the subject:

- **Name and Surname of the candidate**
- **"DIEE Excellence Project Scholarships – Scholarship n. -- /2026 "**

In the subject of the email, the candidate is required to indicate the identifying number of the scholarship for which the application is being submitted.

The submission of the application shall be completed by digital signature or autograph as follows:

- a) by means of a digital signature, or remote digital signature;



b) by handwritten signature: if the above options are not available, the candidate must print Annexes No. 1, A and B, provide full handwritten signature on the last page of the printed document. These documents must be produced in PDF format and the obtained files must be sent with a copy of a valid identity document.

Handwritten applications will not be considered.

In the application (Annex 1), the candidate declares under his or her responsibility:

1. name and surname;
2. place and date of birth;
3. registered residence;
4. current address
5. tax code (if owned);
6. citizenship;
7. e-mail address (PEC address if owned) to which he or she wishes to receive the communications relating to the call;
8. to meet the requirements of art. 3.1 and 3.2 and to be aware of the text of the call;
9. to be aware of the criminal sanctions provided by Article 76 of Presidential Decree No. 445/2000, for false declarations or declarations containing incorrect data.
10. to have read the notice on data processing by the University of Cagliari for the category Citizens, published on the site https://www.unica.it/unica/it/utility_privacy.page.
11. to express consent to the communication and dissemination of personal data within the scope and modalities indicated in the call;

The following documents must be attached to the application (Annex 1):

1. Annex A: "Valuable qualifications and CV";
2. Annex B: "Degree/s, examinations, grades, CFU and dates"; for the candidate/s with Italian degree, Annex B is replaceable by the self-certification drawn up pursuant to art. 46 and 47 of the D.P.R. 445/2000, downloadable from the website of the University where the title was obtained with the list of passed exams, grades and credits, weighted average of exam grades.



3. Only for candidates who have obtained a degree abroad, certificate attesting the possession of the first-level foreign degree, with the list of passed exams, grades and credits, weighted average of the exam grades; if possible, scale used for the grades and minimum value, date of registration and achievement, scale used for the final grade and minimum value, accompanied by translation into Italian or English
4. Only for the candidates/s enrolled in a (second cycle or single cycle) study program abroad, the certificate of enrolment at the foreign university accompanied by translation into Italian or English and the list of passed exams, the corresponding grades and credits, weighted average of the exam grades (if possible, scale used for the grades, minimum value) accompanied by translation into Italian or English;
5. Photocopy (unauthenticated) of a valid identification document:
 - for Italian and European citizens. front/back scan in colour of a valid ID document, with clear photo
 - for extra UE candidates, front/back scan in colour of a valid passport, not expiring within 12 months after the deadline of the call, with clear photo;
6. Motivation letter

To enable the evaluation of degrees and qualifications, the candidate may attach to the application any document, title and publication which he considers appropriate to submit in his / her own interest.

The application is excluded from the call if the above documents drawn up as indicated therein, are not attached to the application.

Pursuant to art. 40 of the D.P.R. n. 445/2000, Public Administrations cannot accept from private individuals, nor require, certificates produced by other Italian public institutions. Therefore, all qualifications that can be assessed for admission to courses, that can be certified or attested by Italian public authorities must be produced exclusively through a self-declaration of certifications or a self-declaration affidavit, according to art. 46 and 47 of D.P.R. n. 445/2000.



Publications and other qualifications issued by private entities must be produced in pdf format together with a self-declaration attesting their conformity to the original version, according to art. 19 and 19-bis of the D.P.R. n. 445/2000.

EU citizens can submit their replacement declarations according to articles 46, 47, 19 and 19-bis of the D.P.R. n. 445/2000.

Non-EU citizens, legally residing in Italy, may use the above-mentioned replacement declarations only with reference to the states, personal qualities and facts that can be certified or attested by Italian public entities.

The Administration office reserves the right to perform checks on the truthfulness of any declarations. Without prejudice to the penal measures provided for in art. 76 of Presidential Decree 445/2000, should it emerge from these checks that the content of the declaration is untruthful, the person making the declaration will forfeit eligibility for the scholarship.

The application, complete with all the required documentation, must be received by the Administration no later than the deadline set in this call. The untruthfulness of the data declared in the application can be contested during all stages of the procedure and determines the consequent lapse of the application or revocation of the grant pursuant to art. 75 of the aforementioned D.P.R. 445/2000.

The Administration assumes no responsibility for applications received after the deadline.

ART. 5 ADMISSION TESTS

The applications received will be examined by the Selection committee appointed by the Head of Department.

The Selection committee has 100 points: 40 points for the qualifications and 60 points for the interview.

The qualifications for valuation are:

- final grade of degree (if obtained) and weighted average of the examination marks
- weighted average of the exam grades and number of credits obtained in the degree programs of second cycle or single cycle referred to in art. 3.1;
- publications



- language certifications
- any other qualification submitted by the candidate
- curriculum vitae
- Motivational letter (maximum 2000 characters)

The Selection Committee, having verified the admission requirements, preliminarily defines methods and criteria for evaluating the qualifications provided for in the call and the minimum score, for admission to the interview. The selection takes place through the preliminary evaluation of the qualifications presented by each candidate with the assignment of the relative score, and in a subsequent interview aimed at ascertaining the suitability of the admitted candidates. The admitted candidates will be notified by email and/or publication on the same website, of the date, time and location of the interview, with at least 15 days' notice.

The interview could also take place via videoconference, after verifying the identity of the candidate by displaying the identity document submitted with the application for the competition.

During the interview, knowledge of the Italian or English language at least at level B2 will be assessed for non-Italian citizens who do not have a certification for Italian or English.

The Selection committee establishes the assessment criteria before consulting the qualifications and other documents.

The overall score is the sum of the scores obtained in the evaluation of the qualifications, to which is added the score obtained for the interview. In the event of equal scores, preference will be given to the younger candidate.

The Commission will prepare and submit to the Head of Department a merit-based ranking, indicating the eligible candidates and the amount of the scholarships, based on which the Award Decree will be issued."

This Administration ensures equality and equal opportunities between men and women in participating in selection procedures.

Art. 6 - AWARD OF THE GRANT



The announcement of the outcome of the call will be published on page [unica.it - Borse di Studio](http://unica.it)

Candidates, who are not Italian citizens or European Union citizens, must comply with the rules on entry and residence.

The candidates holding a degree obtained abroad, placed in useful position on the merit-based ranking referred to in article 5, upon their arrival in Cagliari, must submit the following documents to the Secretariat of the Department of Electrical and Electronic Engineering:

1. original or certified copy of the first-level degree with legalized translation into Italian or english;
2. original Transcript of records certifying the enrolment in courses referred to in point 3.1, with legalised translation into italian or english if in a different language;

Candidates from non-EU countries, who have obtained their diploma abroad, even if they reside in Italy, or who are enrolled abroad, must produce the documents referred to in points 1 and 2 accompanied by an apostille or electronic apostille, as laid down in the Aja Convention of 5 October 1961. The updated list of countries that have ratified the Aja Convention and the authorities competent to affix the electronic apostille for each of the states is available on the website of the Aja Conference on Private International Law: <http://www.hcch.net/> HCCH | Apostille Section HCCH | Apostille Section.

If this deadline cannot be met, the candidates holding a foreign degree must submit the documentation within a reasonable time agreed with the Secretariat of DIEE, after which no further extension will be possible.

The amount of the grant will be paid monthly after certification of the activities carried out, at DIEE, by the scientific coordinator. At the end of the activity carried out at the University of Cagliari, the scholarship holder must submit a report on the activity carried out, accompanied by an appropriate statement from the scientific coordinator.

The activities referred to in art. 1 must be carried out within the duration of the scholarship, unless extended.

Art. 7 - OBLIGATIONS AND RIGHTS OF THE WINNERS OF THE SCHOLARSHIP



The activity is concluded when the student has:

- completed the training activities of its programme, in agreement with the scientific coordinator;
- submitted the final report of its study project, which was approved by the scientific coordinator;

Art. 8 - WAIVER

In case of waiver by the winners, at the unquestionable discretion of the Selection Committee, the available positions for the training program, will be offered to the eligible candidates according to the ranking order.

In the event that the scholarship is interrupted before the natural end, due to loss of student status or for any reason, as the scholarship will be paid in deferred monthly payments, only the pro-rata amount due up to the time of interruption will be disbursed. It is understood that, pursuant to art. 6, at the time of interruption, must be presented by the scholarship holder a formal waiver of the scholarship, accompanied by a report on the activity carried out in his/her study project including the completed training activities that the Scientific Coordinator must approve.

Art. 9 - PROCESSING OF PERSONAL DATA

The University of Cagliari is the controller of personal data processing in accordance with the Regulation (EU) 2016/679 of the European Parliament and of the Council, of 27 April 2016, and the Personal data protection code of Lgs. 196/2003, respecting human dignity and the fundamental rights and freedoms of the individual. The data processing information for the category Citizens https://www.unica.it/unica/it/utility_privacy.page.

Art. 10 - PERSON IN CHARGE OF THE PROCEDURE

Pursuant to the provisions of art. 5 of the law 7 August 1990, n. 241, the person responsible for the selective procedure referred to in this call is Dr. Luigi Giordano, Administrative Secretary of DIEE.



Requests for clarification can be submitted, **within the 11th march 2026**, to the e-mail address: scholarship.diee@unica.it **indicating in the subject "Scholarships - Excellence"**.

To ensure transparency and equal conditions between the candidates/s, the answers to questions will be published anonymously in the FAQ on the website page for the Call unica.it - [Borse di Studio](#), as well as directly to the interested party.

Any timely changes to this call will be published on the website of the University.

The University of Cagliari reserves the right, at its sole discretion, not to proceed with the awarding of the scholarships mentioned in this call.

For further information:

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070-6752223

Dr. Luigi Giordano

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Art. 11 - MISCELLANEOUS

This measure is subject to judicial review by the Italian Regional Administrative Court competent for the territory, within 60 (sixty) days from the date of knowledge of publication, according to the procedures set out in Legislative Decree 2 July 2010, n. 104. Alternatively, it is possible to propose an extraordinary appeal to the President of the Republic, pursuant to the Decree of the President of the Republic 24 November 1971, n. 1199, within 120 (one hundred and twenty) days from the same deadline.

The Administration reserves the right to check the truthfulness of what is declared. Notwithstanding the criminal sanctions provided for by art. 76 of DPR 445/2000, if the check shows that the declaration is not true, the applicant ceases to be a grant holder of the scholarship.

ART. 12 - ADVERTISING



This call, written in Italian and English, will be published on the website of the University of Cagliari unica.it - Borse di Studio

References:

[Home page | Università degli Studi di Cagliari](#)

[unica.it - Dipartimento di Ingegneria elettrica ed elettronica](#)

The Head of Department
Prof. Luigi Atzori
Digitally signed