

SELECTION ANNOUNCEMENT No. 2021S46

BY QUALIFICATIONS AND EXAMINATIONS TO RECRUIT NO. 1 LEVEL I RESEARCH TECHNOLOGIST ON A FULL-TIME FIXED-TERM CONTRACT FOR 24 MONTHS (FINANCIAL POSITION EP1) PURSUANT TO ART. 24BIS OF LAW NO. 240 OF 30.12.2010, AND TO THE NATIONAL COLLECTIVE BARGAINING AGREEMENT OF 19.04.2018, AT THE DEPARTMENT OF PHYSICS AND ASTRONOMY.

By implementing Art. 24bis of Law no. 240 of 30.12.2010 and the National Collective Bargaining Agreement of 19.04.2018, the University of Padova plans to recruit Level I research technologist by qualifications and examinations on a full-time fixed-term contract, for 24 months (financial position EP1) at the Department of Physics and Astronomy.

The main research and technological innovation goals of the project are:

- 1) establish a conceptual and methodological basis for determining criticality from neural activity data in the continuum by exploiting finite size scaling and scale invariance techniques derived from criticality theory;
- 2) analyze criticality features in the time domain, such as scale invariance and long-range temporal correlations, evaluated in EEG and LFP time series using deviated fluctuation analysis of the MatLab NBT toolbox (<http://www.nbtwiki.net/>);
- 3) develop a whole brain model to simulate neural activity, through a system of coupled differential equations representing the activity of neurons or populations of neurons.
- 4) to study time domain criticality features, such as scale invariance and long-range temporal correlations, in electrophysiological recordings of premature infants, newborns, and young children using deviant fluctuation analysis and other methods from statistical physics.

The aforementioned activities require the following **professional skills, knowledge and competences**:

- knowledge, also through experience in similar research projects, of technical support to research activities as well as to the management of the project in its entirety;
- specific knowledge of appropriate libraries for the analysis of EEG and LFP time series and signal processing;
- skills in statistical mechanics and complex systems for the development of generative models based on coupled dynamical systems.
- skills in neuroscience and biophysics.

In summary, the skills required for the professional profile sought are:

- high knowledge of critical models of whole brain and neural activity;
- in-depth knowledge of numerical techniques for signal analysis;
- in-depth knowledge of programming languages dedicated to simulation and data analysis in neuroscience (e.g. Matlab);
- knowledge of Italian and English language level B1;
- good skills related to the organization and coordination of working groups.

Admission requirements

Candidates must have the following requirements by the selection announcement deadline:

- academic qualifications:

a second-cycle degree (*Laurea Magistrale*) (ex DM 270/04) in class LM-17 Physics, LM-58 Universe Sciences;

or a second-cycle degree (*Laurea Specialistica*) (ex DM 509/99) recognised as the equivalent by Interministerial Decree DI 9.7.2009 in class 20/S Fisica, 66/S Scienze dell'universo;

or a degree (*Diploma di Laurea V.O.*) (prior to DM 509/99) recognised as the equivalent by Interministerial Decree DI 9.7.2009 in Astronomia, Fisica.

A degree (*Diploma di Laurea*) (prior to DM 509/99) in Fisica must be recognised as the equivalent of an LM-17 Physics or LM-58 Universe Sciences second-cycle degree (*Laurea Magistrale*) by the awarding university.

- specific professional qualification pertinent to the research:

the candidate must be in possession of a PhD degree in ERC domains “Physical Sciences - PE2 o PE3”.

Candidates **holding a foreign degree** may take part in the selection only after completing a degree-equivalency process pursuant to Art. 38, paragraph 3 of Legislative Decree DL 165/2001. Candidates are conditionally admitted to the selection procedure if the equivalency process is underway, but no final decision has been reached. They must have had their degree recognised as the equivalent of an Italian degree by the time they are recruited.

The degree-equivalency process must be started before the selection-announcement deadline, otherwise the candidate will be excluded from the selection procedure. Candidates must inform the procedure manager that they have applied for degree equivalency.

The degree-equivalency application form is available at:

<http://www.funzionepubblica.gov.it/strumenti-e-controlli/modulistica>

- Italian citizenship (Italians who are not citizens of the Republic of Italy have the same rights as Italian nationals), or citizenship of an EU Member State. Following implementation of Art. 7 of Law 97/2013, the following may also apply for the selection procedure: family of citizens from an EU Member State who do not have citizenship of an EU Member State, but do have the right of residence, or the permanent right of residence; and third-country nationals with a long-term EU permit of stay, with refugee status, or with subsidiary protection status;
- candidates with full political rights;
- candidates who are physically suitable for the position;
- candidates who have completed their military service.

Non-Italian nationals are required to:

- have full civil and political rights in their country of origin;
- fulfil the same requirements as Italian nationals, but do not need Italian citizenship;
- have a good knowledge of Italian.

Application form

The application form and appendices for this selection announcement **must be submitted online** with the Pica platform at: <https://pica.cineca.it/unipd/tipologia/pta>.

To apply online, candidates must have a valid email address so that they can register with the system. They must also provide all of the information needed to complete the application and attach the required documents in electronic form.

The system allows the application to be saved in draft form until the submission deadline. The online application procedure and submission must be completed by **2 pm on October the 15th 2021, when the selection announcement closes** .

The system will certify the date that the online application form is submitted by emailing candidates an automatic receipt. Once the submission deadline has expired, the system will shut down access and applications can no longer be sent.

If necessary, a submitted application form can be withdrawn and another one submitted **before the application deadline (2 pm on October the 15th 2021)**.

Each application will be given an identification number which must be included in any correspondence, along with the selection announcement code stated in the online procedure. Candidates must complete each and every part of the application form in accordance with the online instructions. The application is to be completed as follows:

- with a digital signature using a smart card, USB token or remote signature that enables the user to sign documents with signature software. Alternatively, a web portal may be used to provide a certified remote signature. Candidates with a smart card or USB token for digital signing can check for compatibility with the server's digital-signing system. If compatible, the user may sign the application on the server;
- candidates who do not have compatible digital-signing devices and users of remote digital signatures without web portal access for signing documents will have to save a system-generated pdf file on their computer. After which, they must not edit the file and e-sign it in CADES format. A file with a p7m extension will be generated and uploaded into the system. If the file is edited before the e-signature is applied, the system will be unable to verify whether the content of this document matches the original. If this occurs, the application will be rejected.
- If none of the aforementioned options are available:
print and hand-sign the application form, then upload **a scanned copy along with a scanned form of identification. Candidates not providing identification may be excluded from the selection procedure.**

The system may be momentarily offline for technical reasons.

Non-Italian candidates are to submit their application form as per the methods and deadlines stated in this application procedure.

Documents must be in a static, non-editable format and must not contain executable codes or macro-instructions. PDF is the preferred format. Documents must not exceed 30 MB.

The University of Padova is not liable for undelivered correspondence should candidates not provide a complete address, or when late or no notification is provided should the address on the application form change. Nor is it liable for problems caused by third parties, misfortune or force majeure.

For additional information or queries about the application procedure, please contact the Technical and Administrative Personnel office on +39 049 827 3155 - 3159 - 3494 between 9 am and 1 pm.

Contact the following email address for technical problems only: unipadova@cineca.it.

Candidates must state under their own responsibility their surname and first name, their date and place of birth, their permanent address, any telephone number, any criminal convictions and pending criminal procedures, that they enjoy full political rights, their military-service status, a detailed statement they meet the aforementioned requirements, and the exact contact address for any correspondence.

Candidates are admitted to the selection procedure conditionally. Should any of the requirements not be met, candidates may be excluded from the selection procedure at any moment, even after they have taken the tests.

Selection

Candidates are selected by qualifications and examinations.

A total of 90 points are awarded for qualifications and examinations. They are divided as follows:

- 30 points for qualifications;
- 60 points for examinations (30 points for written test and 30 points for oral examination).

Qualifications

Candidates will be assessed on the following qualifications:

1) final grade of the Master Degree or equivalent	max 10 points
2) relevance of the PhD Degree to the ERC Domains <i>Physical Sciences</i> PE2 or PE3: the candidate shall state the relevance of his/her PhD to the PE2 or PE3 domains in his/her application, (s)he will also have to specify the title for his/her final doctoral thesis	max 20 points

The score awarded for qualifications will be out of 30.

EU candidates must provide all of the statuses, information and qualities that they deem useful for the assessment of their qualifications in a statutory declaration, as per Art. 46 and 47 of Presidential Decree DPR no. 445/2000. Non-EU candidates are not allowed to use a statutory declaration, as per Art. 3 of Presidential Decree DPR no. 445/2000.

Certificates issued by the European Union or Italy's Public Administration must not be submitted.

The evaluation of the qualifications will be carried out after the written test and before proceeding to the correction of the related documents. Candidates will be notified of their qualification-assessment result before they take the oral examination.

Examinations

Examinations will comprise a written test and an oral examination.

- **The written test** will focus on the following topics:
 - theory and analysis of neural signals, modeling of neural activity, theory of critical phenomena in statistical physics
- **The oral examination** will focus on the following topics:
 - research experience in the project area

- theory and analysis of neural signals, modeling of neural activity, theory of critical phenomena in statistical physics.

The possession of computer skills and the knowledge of the English language (European Framework of Reference for Languages: level B1) will be tested during the oral examination.

Examinations (calendar, locations and process of selection) will be published on the University of Padova's Official Register (<https://protocollo.unipd.it/albo/viewer>) and on the University of Padova website (<https://www.unipd.it/selezione-2021S46>) **starting from 2 pm on October the 5th 2021.**

No further notice will be given.

Publication of this calendar is considered to be notification.

Approved candidates must come on the date and at the time that will be communicated. No further notice will be given.

Candidates must show a valid ID document before being admitted to the examinations.

Any candidates not coming to the examination will be deemed to have waived their place, regardless of the reason.

The examinations pass mark is 21/30 (7/10).

The list of candidates admitted to oral examinations will be published with their scores for the written test on the noticeboard of the Department of Physics and Astronomy, Via Marzolo, 8 - 35131 Padova, and posted on the University of Padova website at <https://www.unipd.it/selezione-2021S46>.

All Commission sessions during the oral examination are public. At the end of each oral examination, the Commission will draw up a list of the candidates assessed with a score for those who have passed the examination. This list, which is signed by the Commission Chair and the Secretary, will be posted on the noticeboard of the Department of Physics and Astronomy, Via Marzolo, 8 - 35131 Padova, and on the University of Padova website at <https://www.unipd.it/selezione-2021S46>.

Candidates can access the list with a personal password provided to all selection participants.

Overall ranking

The final score is calculated by adding up the score for the written test, the oral examination and the score for qualification assessment.

The overall ranking will be published in the University of Padova's Official Register. Any appeals may be filed the day after the ranking is published.

The overall ranking is effective immediately.

The winner is entitled to the gross annual salary for the EP category, financial position EP1, as per the University section of the current National Collective Bargaining Agreement (CCNL), as well as to an additional quota as specified in the "University Regulations for Recruiting and Regulating 'Fixed-term

Research Technologists', in accordance with Art. 24-*bis* of Law no. 240 of 30 December 2010." The salary will be paid into a bank or post-office account only.

The administration may decide not to draw up the agreement should there cease to be the need, opportunity or resources to proceed.

The ranking is valid for three years from its publication date and may be used to recruit additional fixed-term technologists with the same profile and level. All other aspects of employment will depend on the University's specific needs.

Pursuant to Decree no. 111 of 6th August 2021, starting from 1st September 2021, the winner who will begin working at any university premises is required to have and show the COVID-19 vaccination certificate, i.e. "Green pass", when requested.

This requirement does not apply to those who are exempted from the vaccination campaign as per suitable medical certification issued according to the criteria defined by the Ministry of Health. However, they will need to show this certificate when asked.

It is understood that these provisions remain in place until the state of emergency comes to an end, namely 31st December 2021, provided no further extensions are granted through ministerial provisions.

Anything not stated above is covered by the "University Regulations for Recruiting and Regulating 'Fixed-term Research Technologists', in accordance with Art. 24-*bis* of Law no. 240 of 30 December 2010", available at: <http://www.unipd.it> (see "Statuto e Regolamenti").

Pursuant to Law no. 241 of 7.8.1990, the selection-procedure manager is Maria Zanato – *Ufficio personale tecnico amministrativo*, Riviera Tito Livio, 6, Padova, Italy.

The Technical-Administrative Staff office (*Ufficio personale tecnico amministrativo*) is open to the public at the following times:

From Monday to Friday from 10 am to 1 pm and on Tuesday and Thursday from 3 pm to 4.30 pm.

NB: This selection announcement has been translated into English for publication purposes only. The Italian version is valid for all legal purposes and for the resolution of any disputes.

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e-mail: reclutamento.pta@unipd.it

Padua

The Director-General

Alberto Scuttari

digital signature (ex Legislative Decree 82/2005)

Office Manager Maria Zanato	Department Manager Tommaso Meacci
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