



UNIVERSITÀ DI PISA

### Call for the selection of no. 1 temporary research associate position:

The University of Pisa announces the public selection, assessed by qualifications and interview, for the assignment of n. 1 grant for research activities (hereinafter referred as “research grants”) as provided in the Annex A, with a specific tab for each project listing the reference structure, the research object, the scientific field, a summary of the background and skills of the fellow, information relating to the interview.

Research grants will be funded on the POR FSE TOSCANA 2014-2020 resources in the frame of the Regione Toscana project Giovanisì ([www.giovanisi.it](http://www.giovanisi.it)), aiming to enhance young people’s autonomy.

Successful candidates will have to carry out their research activities mainly (at least 50% of the research activity period) with one of the operators of the regional cultural and creative network that collaborates on the project and is a mandatory component of the partnership.

**Contract duration:** 24 months

**Gross annual salary:** € 28.000,00

#### Admission requirements:

- Hold a master degree at the time of application submission;
- Be under the age of 36 by the application submission;

Successful candidates currently holding other fellowships or research grants, are asked to renounce before the acceptance of the research grants referred in this notice, without prejudice to the provisions stated in the Law 30/12/2010 n. 240, art. 22, subparagraph III (exception laid down for the scholarships awarded by national or foreign institutions and aiming to complement the research activities with a stay abroad).

The selection does not enable nationality limitations and follows the cross-cutting priorities of gender equality and equal opportunities.

#### Applications:

Applications shall be submitted online only, at the following link: <https://pica.cineca.it/unipi/>

or shall be invalid. It is necessary to have an email address to login and complete the application.

Applicants should fill in all the required data and upload all documents in PDF format.

The system allows saving a draft of the application within the application deadline. The system will register the online application date and send a receipt with an automatic e-mail reply. After deadline, the system will not allow login nor application submission.

In order to be valid, application shall include all the required data, applicant's signature and a valid identification document.

Each application will be assigned a unique identification number to be referred to in all subsequent communications, together with the selection code provided by the application form.

Applicants undertake to communicate in writing any variations of what declared in the application form.

The communication shall be edited in PDF format, signed and forwarded to the Rector of the University of Pisa by the Italian certified e-mail system address ( P.E.C. Posta Elettronica Certificata): [protocollo@pec.unipi.it](mailto:protocollo@pec.unipi.it) or via e-mail at: [concorsi\\_assegni@unipi.it](mailto:concorsi_assegni@unipi.it) within the application's deadline. Applicant's valid identification document should be annexed.

For further information on application submission, please refer to [concorsi\\_assegni@unipi.it](mailto:concorsi_assegni@unipi.it)

For any IT malfunctioning please refer to [unipi@cineca.it](mailto:unipi@cineca.it).

Applications shall be completed with the following annexes:

1. A training-learning-research project with details of the outcomes and the professional development the candidate aims to achieve through the participation in the selected research project;
2. A self-attested Curriculum of the personal education, post graduate degrees, scientific experiences and research products (publications, patents, etc.);
3. The qualifications the applicant considers eligible for this selection;
4. The Publications the applicant considers eligible for this selection;
5. A list of Publications and qualifications;
6. A copy of the fiscal code (if applicable) and identification card/passport;

All publications format should not exceed 30 megabyte and should be submitted in PDF only, using the specific section of the application form.

#### **Selection procedure:**

For each selection procedure the Director of the University Department involved in the research project will appoint a committee of three members.

The selection is assessed by qualifications and interview.

For the selection the committee will evaluate:

- a) the consistency between the training-learning-research project the candidate proposed and the specific research project;
- b) the consistency between the curriculum vitae, the course of study, the research experiences made and the requested project profile;
- c) the academic qualifications and the number and quality of research results achieved (publications, patents, etc.);
- d) the rating obtained by the interview, which is intended to assess attitude, motivation and background of the candidate participating in the project.

The rating assigned to the candidates as for point b) shall not be less than 40% of the total rating achievable and the rating assigned to the candidates as for point c) shall not be less than 30% of the total rating achievable.

**For the interviews timetable, please refer to each research grant tab annexed to this call.**

The candidates are invited to check the University website (<https://www.unipi.it/ateneo/bandi/assegni/index.htm>) during the two days before the date set for the interview.

The failed attendance to the interview will be considered as a voluntary renunciation.

Upon the Selection Committee approval, candidates committed abroad and therefore unable to attend to the interview at the University of Pisa, will be allowed to be interviewed via the web, prior applicant's identification by approved international universities or research centers. The Selection Committee is appointed to establish the duly examination of the candidates and shall acquire each candidate's copy of ID or passport.

The research grants will be allocated no later than 20 March 2020, as required by the call for selection of the Regione Toscana.

Please note that the English version is given as a matter of courtesy, for the only purpose of information. It cannot be legally used in the event of a dispute or a claim arising from the interpretation of this translation and concerning the contents, a possible uncertainty, contradiction or discrepancy. Should this occurs, the Italian version of the call shall prevail as the only valid. For full Italian text, please see: <https://www.unipi.it/ateneo/bandi/assegni/index.htm>.

Department of Energy, Systems, Territory and Construction Engineering

Acronym “M.C.M.”

**Project Title funded by the Tuscany Region:**

“Monitoring Methods and Systems for Monumental Complex”

**Scientist in charge of the Research Project funded by the Tuscany Region:**

Dr. Anna De Falco

**Title of the Research activity:**

“Design of a Structural Health Monitoring system for a Monumental Complex”

**Project summary:**

Preservation of cultural heritage in Italy is a problem of great complexity. Current approaches are generally intermittent, unplanned and lacking in methodical strategy, too often applied in emergency contexts. However failure of monuments due to the earthquake or changes in environmental conditions sometimes occurs. The fundamental basis of conservation is provided by prevention, making use of the knowledge of the structural behavior of buildings over time. Structural monitoring is a tool that allows for both knowledge and surveillance of monuments. This project deals with structural monitoring of the entire monumental complex of *Piazza del Duomo* in Pisa, where extremely deformable soil has generated the well-known singularity of the Leaning Tower. The key point of the project is the presence of several monumental structures belonging to the same complex, and sharing the same environmental conditions and soil type. This advantage can be exploited for the design of the instrumental monitoring system.

The main objective is to lay the foundations for the development of a global Structural Health Monitoring (SHM) system for the automated analysis of structures, taking advantage of new control methodologies, combining traditional experimental techniques with emerging and non-conventional ones. The project involves two activities. The first consists in the construction of a predictive model, regression-based or probabilistic, regarding only the Tower (digital twin model). This represents a first experience to be applied to the other monuments of *Piazza del Duomo* in Pisa after the end of the project. The second activity is the design and extension of the Tower’s monitoring system to the remaining buildings, after an accurate analysis of knowledge needs.

As a further research development, a predictive model of the entire Monumental Complex, updated in real time through state-of-the-art techniques (artificial intelligence algorithms and Bayesian inference) could be created as a tool for monitoring the behavior of the structures, correlating damage with experimental observations. This tool can be useful for the Managing Authority and for the Civil Protection body to plan maintenance interventions or emergency strategies. The obtained results could be extended, after appropriate adjustments, to other monumental complexes.

**Scientific discipline sector:**

ICAR/09 - Structural engineering

**Number of fellowships:**

1

**Summary of the background and skills of the fellow:**

The fellow that will undergo training under this project will be a Master's graduate, whose curriculum is characterized by Structural Engineering topics. He will need to be an expert in the use of finite element calculation and data analysis software and to have the ability to solve complex problems. He needs also to have a background about historic buildings and monitoring systems. During the project he will hone its sensitivity for damage detection and structural behaviour perception, and will also develop knowledge in the field of probability and statistics, together with the mathematical tools to manage and analyse large amounts of data. At the end of the work, he will be able to manage a monitoring system for cultural heritage and the consequent large quantity of data, and to model the behaviour of an historic building.

**Fellow's Supervisor**

Dr. Anna De Falco

**Date, time and place of the interview:**

2<sup>nd</sup> march 2020 at 9 am - Department of Energy, Systems, Territory and Construction Engineering - Largo Lucio Lazzarino - Pisa.