

2019 Terms of Reference for  
Exploratory Research Projects under the  
University of Texas at Austin Portugal Program



## Table of Contents

|  |           |
|--|-----------|
| <b>1. Introduction</b>   | <b>2</b>  |
| <b>1.1. Objectives</b>   | <b>2</b>  |
| <b>1.2. Research Areas</b>   | <b>2</b>  |
| a) Advanced Computing  | 3         |
| b) Medical Physics for Emerging Cancer Therapies                       | 3         |
| c) Nano Materials for New Markets                                      | 3         |
| d) Space-Earth Interactions  | 4         |
| <b>2. Award Information</b>  | <b>5</b>  |
| <b>2.1. Regulations and guidelines</b>                                 | <b>5</b>  |
| <b>2.2. Estimated number of awards and funding amount</b>              | <b>5</b>  |
| <b>2.3. Duration of projects</b>                                       | <b>6</b>  |
| <b>2.4. Supported Entities</b>   | <b>6</b>  |
| <b>2.5. Applications and deadline for receipt of full applications</b> | <b>7</b>  |
| <b>2.6. Format requirements</b>  | <b>7</b>  |
| <b>2.7. Review of applications</b>                                     | <b>9</b>  |
| <b>2.8. Notification, start of activity and reporting</b>              | <b>9</b>  |
| <b>3. Eligibility Information</b>                                      | <b>10</b> |
| <b>3.1. Requirements for participating</b>                             | <b>10</b> |
| <b>3.2. Principal Investigators (PI)</b>                               | <b>10</b> |
| <b>3.3. Limit on number of proposals per PI and per organization</b>   | <b>11</b> |
| <b>3.4. PI and researchers' dedication</b>                             | <b>11</b> |
| <b>4. Evaluation and selection</b>                                     | <b>11</b> |
| <b>5. Additional Information</b>                                       | <b>13</b> |

## 1. Introduction

The UT Austin Portugal Program is a partnership program in Science and Technology between the Portuguese Foundation for Science and Technology and the University of Texas at Austin, supported by the Ministry of Science, Technology, and Higher Education in close collaboration with the Council of Rectors of the Portuguese Universities.

Launched in 2007 the partnership has been renewed in 2018, towards a new decade until 2030. The UT Austin Portugal Program addresses a number of knowledge areas where scientists and companies in Portugal will engage with the University and other institutions in Texas in multidisciplinary education, research and technology transfer and commercialization. The vision is to contribute to a knowledge-based society and foster science and innovation-based companies to help Portugal face the challenges of the future.

### 1.1. Objectives

The UT Austin Portugal Program is inviting submissions for Exploratory Research Projects. Within the scope of this call, the Program is seeking for collaborative research work involving the University of Texas at Austin (UT Austin) and Portuguese research institutions and industry partners to stimulate high-impact potential research activities of strategic relevance for the partnership.

Proposals for Exploratory Research Projects are expected to be high-risk/high-reward and show promise and a strategy for potential future expansion of project goals.

### 1.2. Research Areas

The basis of the Program focuses on enabling technologies: **nanotechnologies**, which bring a revolution to products and systems through novel advanced materials, and **advanced computing** paradigms, technologies and services which, together with thriving data science approaches, allow us to make intelligent and valuable use of the massive amounts of data we have access today. Additionally, two big challenges will be tackled, in **medical physics**, with impact on health and quality of life, and in **space-earth interactions**, in areas related to the new Atlantic International Research (AIR) Center (space, sea, climate and energy) which will be looking at some of the ocean's most valuable assets.

## a) Advanced Computing

High Performance Computing, High Throughput Computing and Quantum Computing

New research and innovation agenda to increase the usage of advanced computing resources (high performance computing, high throughput computing and quantum computing) by the science, innovation and industry communities in Portugal.

Novel paradigms, hardware, software and co-design architectures, algorithms, frameworks, tools and applications should be devised together with proof-of-concept or pilot projects to better assess and exploit the use of advanced computing facilities for digital simulation, big data processing, optimization, machine learning and visualization in a variety of domains, including cities, agriculture, fisheries, earth observation, transportation, health and security. Synergies with the Minho Advanced Computing Centre are desirable.

Three kinds of research directions are envisaged:

- i) Technologies and infrastructure: groundbreaking research addressing the level of operating systems, data, communication and processing management middleware, high-performance libraries and tools for processing and visualization;
- ii) Models, paradigms, programming languages and algorithms: research on innovative methods and tools to underpin or develop high performance systems and applications;
- iii) Applications: research on innovative applications for any scientific domain justifiably requiring or taking advantage of high performance computing systems.

## b) Medical Physics for Emerging Cancer Therapies

Collaborative research in the areas of medical physics, proton therapies, and radiation oncology involving faculty at UT Austin - namely at Dell Medical School and Cockrell School of Engineering - at The University of Texas' MD Anderson Cancer Center, and Portuguese universities and research institutions.

## c) Nano Materials for New Markets

This program area establishes a research and innovation agenda focused on materials engineering and science with an integrative approach to nanoscience, over diversified applications. Research focuses on the discovery and development of innovative nanomaterials, with a range of unique properties suitable for applications in space, sensing, the internet of things, information technology and energy harvesting and storage, including quantum computing, medical diagnostics and therapy, efficient chemical and materials transformations.

#### d) Space-Earth Interactions

Research involving transatlantic and north-south cooperation in complex systems engineering and science towards an integrative approach to space technologies, climate and clean energy, earth and ocean science in the Atlantic, together with emerging methods of data science, where synergies with the Atlantic International Research Center (AIR Center) are desirable.

This call should focus on exploiting the potential of integrating space-borne, airborne, and in-situ (including underwater) data, towards a better understanding of the ocean. Special emphasis will be placed on the deep sea, and the ocean's interaction with the other components of the Earth system, in order to improve predictive capabilities under climate change scenarios.

Three initial research thrusts have been identified:

- i) *Satellite remote sensing of the oceans*: This research thrust is focused on different but complementary topics that can concur for a better understanding of processes occurring in open-ocean, coastal and island regions, and for improving ocean bottom topography resolution, characterizing regional sea level variations and unraveling ocean circulation patterns at different spatial and temporal scales.

Topics to be addressed are:

- innovative methods for the exploitation of new satellite mission's data, reanalysis of historical satellite data, and exploitation of available satellite signals, acquired from space or air, including GNSS-R and GNSS-SAR;
- new technologies for dense low-cost ocean monitoring, including in-situ or remote observations, that can complement satellite data. Optimal integration of different sensors and platforms (spatial (micro or nanosatellites), aerial (unmanned airplanes, drones, etc.) to maritime (autonomous vehicles, buoys, etc.)) is also a target.

- ii) *Deep sea science and exploration*: This research thrust targets the development of scalable approaches for deep sea monitoring across the physical, biogeochemical, biological and ecosystems disciplines. The research is guided by the Framework for Ocean Observing developed by the Global Ocean Observing System (GOOS) and refined for essential deep ocean variables by the Deep Ocean Observing Strategy (DOOS) project. A focus will be on the Azores Archipelago as a gateway for developing scalable multidisciplinary deep ocean observing approaches. Research will target platform and sensor technology, numerical simulation

approaches for advanced model-data synthesis and calibration, and advanced cyberinfrastructure for advancing deep ocean data analytics.

- iii) *Computational science and engineering for the next generation of spacecraft*: This research thrust addresses simulation-based science that supports the advanced design and manufacture of disruptive spacecraft structures and mechanical systems, including nano to micro satellites, new launcher concepts, and deployable structures and mechanisms.

## 2. Award Information

### 2.1. Regulations and guidelines

- Regulations governing access to funding are available at: <https://www.fct.pt/apoios/projectos/regulamentofundosnacionais.phtml.en>
- The announcement of the opening of this call is available [here](#);
- The Guidelines for Exploratory Research Projects Proposals Writing are available [here](#);
- The roadmap for Phase III of the UT Austin Portugal Program is available [here](#);
- Guide for Peer Reviewers available [here](#).

### 2.2. Estimated number of awards and funding amount

Depending upon the quality of the proposals, a maximum of 8 (eight) new ERP awards are expected to be financed, pending on the budget.

The total funding available for Portuguese research institutions in this call will be up to €400,000 (four-hundred thousand euros).

Up to \$400,000 (four-hundred thousand US dollars) will be available to support complementary activities of the UT Austin research teams, covered by the UT Austin Portugal Program budget at UT Austin. The exact budget at UT Austin will be determined by the time FCT communicates the evaluation results to UT Austin.

The maximum funding in each project is € 50,000 (fifty-thousand euros) for the team in Portugal plus \$50,000 (fifty-thousand dollars) for the team at UT Austin.

### **Research Teams in Portugal – Financing payment procedures**

An advance payment of 75% of the funding approved for the financed projects will be made by FCT after returning the acceptance documents after the Acceptance Documents return.

The remaining amount, until the approved funding, will be paid after the scientific and financial components of the project are closed and by means of a final refund payment.

The expenditure justification should be made via electronic submission of only one payment request, in a specific form provided through the FCT internet Portal.

The involved companies or other independent non-academic organizations will not be funded by FCT.

### **Research Teams at UT Austin**

Eligible expenses at UT Austin are the ones directly related to the research: e.g. materials, lab time, equipment usage, graduate student tuition/stipends, travel. Faculty salary and equipment are non-eligible.

## 2.3. Duration of projects

The projects will have a maximum duration of 12 months, intended to start in 2020. Project accomplishments will be assessed, once finished, by the Board of Directors of the UT Austin Portugal Program and FCT. The progress achieved by the team may, nevertheless, be assessed after the first semester.

## 2.4. Supported Entities

Only the following Portuguese entities are eligible to receive funding from FCT through the present Call for Proposals:

- Higher Education Institutions, their institutes and R&D units;
- State or International Laboratories with head office in Portugal;
- Non-profit private institutions whose main objective is R&D activities;
- Other non-profit private and public institutions developing or participating in scientific research activities.



## 2.5.Applications and deadline for receipt of full applications

Applications must be submitted online through the FCT website <https://concursos.fct.pt/projectos/> following the Announcement of the Call for Proposals.

The call is open from **6 November until 17 December 2019**, at 17:00 Lisbon time.

## 2.6 Format requirements

Full applications must fulfill the following format requirements:

- **Completion of the on-line FCT form**, available through the FCT platform (<https://concursos.fct.pt/projectos/> ), according to the [Guidelines for Exploratory Research Projects Proposals Writing](#).
- **Submission of the Technical Annex**, appended to the online FCT form, which fulfills the proposal requirements as specified in the following points, that must include:

Note that the *.pdf* file should be less than **10 Mbytes**

- Cover page (single page):
  - The reference and the addressed scientific area(s) of this call;
  - Title and the acronym of the project;
  - Name, organization, email address and telephone number of both PIs;
  - A summary of the project.
- Description (not exceeding 4 pages):
  - Objectives (Describe the overall and specific objectives of the project, which should be clear, measurable, realistic and achievable within the duration of the project);
  - Concept (Describe and explain the overall concept underpinning the project. Describe the main ideas and assumptions involved);
  - Exploratory nature and non-incrementality of the proposed research (Identify the relevant state-of-the-art, explain the exploratory nature of the proposed research and the non-incrementality of the envisaged results);
  - Impact (Discuss the potential science-to-technology breakthrough, contributions to the foundation of a new technology and potential of developing it further and beyond the scope of the ERP project, innovative interactions across domains. Whenever possible, use quantified indicators and targets);

- Deliverables (Identify the expected and objectively assessable outcomes within the duration of the project).
- Team (not exceeding 1 page per applicant):
  - The applicants' key personnel profiles (name, organization, individual profile and ORCID/Scopus/Google Scholar id);
  - A concise description of the nature and aims of each partner's contribution.
- Budget (not exceeding 1 page):
  - Indicate the overall budget for the international consortium and also budget allocation by partner; provide a detailed description of the estimated expenses by partner and explain how they correlate with the project's work plan and expected outcomes.
- Commitments of private non-academic organizations (if applicable):
  - Attach Letters of Commitment (LoCs) written on the official letterhead paper of private non-academic organizations participating in the project and signed by their legal representative. The LoCs shall explain the nature of the organization's involvement, and specify the financial and/or in-kind contribution provided by the organization to the consortium. Copies of the original signed letters are accepted at the submission of the application.
- **Submission of the following Eligibility Documents:**
  - The document that certifies the Ph.D. degree of the lead Portugal Principal Investigator;
  - Written agreement between the lead Portugal Principal Investigator and the Proposing Institution (if applicable);
  - A statement from the PI at UT Austin (or at UT MD Anderson Cancer Center for the applications in the area of Medical Physics, if applicable), confirming that he/she will be the PI from UT and that he/she holds a tenured-track faculty appointment at UT Austin. In the case of proposals in the area of Advanced Computing led by PIs at the Texas Advanced Computing Center (TACC), the statement must indicate the PI is a full-time senior researcher with PI status;

- Declaration on the regulatory framework for State Aid - non-corporate entities of the R&I System;
- Timeline file of the project tasks.

Please refer to the document “Guidelines for Exploratory Research Projects Proposals Writing.”

A scan of the **Declaration of Commitment** of each application must be submitted on the FCT platform until **10 January 2020**

Important note: all sections of the FCT form must be filled. Except where mentioned otherwise, all the requested information needs to be English. Please make sure that text entered in the online form is formatted and comprehensive.

General note: Any external references mentioned in the Technical Annex to material pertinent to the proposal will be considered at the discretion of the evaluators.

## 2.7. Review of applications

Projects will be selected on a competitive basis. An international panel of independent experts, organized by FCT, will review the applications. The review panel will be responsible for evaluating the merit of each proposal. The selection for funding is based on the criteria presented in section “4. Evaluation and Selection” of the present document.

The applications must follow the guidelines provided in these Terms of Reference and in the [Guidelines for Exploratory Research Projects Proposals Writing](#).

## 2.8. Notification, start of activity and reporting

The applicants will be notified in accordance with Article 15 of the of the [Regulations for Projects Exclusively Funded by National Funds](#). Funded applications are planned to start in 2020.

At the end of the ERP, a final report will be delivered describing the outcomes of the research for review by the Program’s Board of Directors and FCT. The Board of Directors and FCT may also request that a panel of experts reviews the progress of the Exploratory Research Projects at its end.

## 3. Eligibility Information

### 3.1. Requirements for participating

Applications must be submitted by research consortia that include:

- at least one applicant from a Portuguese research institution;
- at least one applicant from UT Austin (or at UT MD Anderson Cancer Center for the applications on the area of Medical Physics, if applicable).

One of the Portuguese research institutions is the lead institution in Portugal. The UT Austin faculty team is the lead at UT Austin.

In addition to the entities mentioned above, the consortia may include other public or private entities, profit or non-profit, that may also invest in the exploratory project and bring relevant competencies to the project. Participation of companies is encouraged through financial and/or in-kind contributions to the project. However, such entities will not be funded by this call.

### 3.2. Principal Investigators (PI)

The PI on the Portuguese team responsible for the proposal should have a Ph.D. degree. The document certifying the doctoral degree should be included in the Annex to Application and attached to the application.

The lead Portugal PI should also be a professor or have a research position in the Principal Contractor. In the absence of such link, a written agreement between the parties must be attached to the application, according to point c) of the item of article 6 of FCT's Project Regulation.

The lead PI should identify a co-responsible for the project, the Co-Principal Investigator (Co-PI), that will replace the PI when he/she is unable to fulfil his/her duties.

Proposals will not be accepted from lead Portugal PIs affiliated with institutions on a situation of unjustified fault with FCT requirements regarding the delivery of scientific and/or financial execution reports from previous financed projects.

Proposals will also not be accepted from lead Portugal PIs who were PI of any project with a final scientific report rejected within two years before the opening of the Call, for reasons attributable to them.

The UT Austin team should be led by a tenured or tenure-track faculty member, who will be responsible for the project at UT Austin. Faculty and researchers from UT Austin must be closely involved in the development of the research proposals. UT Austin researchers are encouraged to spend short or long-term research periods in Portuguese institutions.

In the area of Medical Physics, faculty at The University of Texas MD Anderson Cancer Center may also participate and/or lead projects. In the area of Advanced Computing, full-time senior researchers from the TACC may also lead projects.

### 3.3. Limit on number of proposals per PI and per organization

The PI in Portugal may only submit one application as PI. Researchers, however, may be listed as co-PIs or senior researchers in multiple proposals.

There is no limit on the number of proposals to be submitted by a lead research institution and there is no limit on the number of Exploratory Research Projects consortia a research institution may join as partner.

### 3.4. PI and researchers' dedication

The remaining members of the Portugal research team shall be dedicated to the project according to their participation.

## 4. Evaluation and selection

Applications will be reviewed by an international panel of independent experts, as organized by the Directors of the Program and FCT.

The selection and ranking of the applications will be based on the following criteria, further detailed in the Regulations Governing Access to Funding for Scientific Research and Technological Development Projects and in the [Guide for Peer Reviewers](#):

- A.** Scientific merit and innovative nature of the project from an international standpoint and alignment with the goals of the UT Austin Portugal Program;
- B.** Scientific merit of the research team;
- C.** Feasibility of the plan of work and reasonableness of the resources and budget;
- D.** Potential social and economic impact of the research work.

The overall **Merit of Project (MP)** is given by the following formula:

$$MP = 0.4 A + 0.2 B + 0.2 C + 0.2 D$$

Each criterion is scored using a 9-point scale system (1 – minimum; 9 – maximum) and rated using this scale with whole numbers only (decimal ratings are not allowed). The final score of MP is rounded to a single decimal place. If information made available in the application does not allow for evaluating a given criterion, then the respective criterion will receive a score of 1 (one).

For a proposal to be eligible for funding, the following minimum score is required:

- MP = 5.0 points.

For the purpose of selection and decision-making regarding funding, projects will be ranked by score obtained in the review process in decreasing order. In case of equal ratings, the locking date of the proposals in the FCT's electronic system will be taken into consideration for the ranking list.

Application of these evaluation criteria shall take into account, among other considerations, the following:

FOR CRITERION A:

- Relevance and originality of the project proposed (based on the state-of-the-art in a determined scientific area and previous work done by the proposing team);
- Thematic alignment of the proposal with the Exploratory Research Projects topics as outlined in the Research Areas described above (1.2 section);
- Adequacy of methodology adopted for carrying out the project;
- Expected results and their contribution to scientific and technological knowledge;
- Resulting publications and articles;
- Contribution towards promoting and disseminating science and technology;
- Production of knowledge that can contribute to benefits to society or to the business sector.

FOR CRITERION B:

- Scientific productivity of the team (references to publications and citations in published works, other relevant indicators);
- Abilities and skills to adequately execute the proposed project (team configuration, PI's qualifications);
- Ability to involve young researchers in training;

- iv. Availability of the team and non-duplication of objectives in relation to other projects underway;
- v. Degree of internationalization of the team;
- vi. Degree of success in previous projects in relation to the Principal Investigator (PI) (in the case of young PIs, this requirement must be assessed based on the potential revealed by the PI's curriculum vitae in the absence of prior concrete accomplishments);
- vii. Level of commitment of any companies participating in the project (if applicable).

FOR CRITERION C:

- i. Organization of the project in terms of the proposed objectives and resources (duration, equipment, size of the team, institutional and management resources);
- ii. Institutional resources of the proposing and participating entities (technical-scientific, organizational and managerial and, when appropriate, co-funding capacity on the part of companies).

FOR CRITERION D

Potential of developing the R&D results further and beyond the scope of the ERP project (also including through engagement with prospective exploitation partners, other stakeholders, users and / or society) leading to technologies with relevant social and economic impact.

## 5. Additional Information

For inquiries of a scientific nature, please contact the UT Austin Portugal Program at [leadership@utaustinportugal.org](mailto:leadership@utaustinportugal.org).

For specific information related to application submission, please contact [concursoprojetos@fct.pt](mailto:concursoprojetos@fct.pt).