



UNIVERSITÀ DEGLI STUDI  
DI TRENTO

Doctoral Programme in Physics

# **TRANS-DISCIPLINARY PROGRAM IN QUANTUM SCIENCE AND TECHNOLOGIES (TPQST)**

Approved by the Doctoral School Committee on 11 march 2019



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**Regulation for the trans-disciplinary program in Quantum science and technologies (TPQST)**

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## **Regulation for the trans-disciplinary program in Quantum science and technologies (TPQST)**

### **Art. 1 - Description**

The Trans-disciplinary Program in Quantum Science and Technologies (hereafter “the Program”) aims at training Ph.D. candidates at the University of Trento with wide interdisciplinary competences in the growing field of Quantum Science and Technology (QST). The rationale is that a deep knowledge of basic science is required in order to contribute to the field as well as to craft innovative devices for applications. The Ph.D. candidate enrolled in this program will receive a state-of-the-art education in the basic ideas of quantum science, in the main material platforms used in experiments, and in the mathematical concepts used for their description, as well as in the information and computation science concepts that aim at exploiting QST for applications. She/he will be expected to carry out cutting-edge research on subjects of interest of the Q@TN consortium, possibly in collaboration with our international project partners.

### **Art. 2 - Criteria for accessing the program and achieving the secondary title**

#### **Art. 2.1 - Enrollment**

The Program is open to students of the Doctoral (Ph.D.) Schools/Programmes of Trento University in *Physics*, in *Mathematics*, in *Materials, Mechatronics and Systems Engineering (MMSE)*, in *Information and Communication Technologies (ICT)*, in *Civil, Environmental and Mechanical Engineering*. A Ph.D. student interested in joining the Program must present an application to the Program Panel (hereafter “the Panel”, The application must include:

- A motivation letter (other than the one presented for applying to the Ph.D., if any), specifying the reasons why the candidate deems her/his research project of interest for the field of QST.
- A brief research proposal, formally approved by the student’s tutor or advisor.

The admission is in any case subjected to the standard procedures adopted in the Doctoral School/Programme in which the PhD student is enrolled.

Applications must be submitted within two months from the start of the PhD and are examined by the Panel in order to evaluate the candidate’s motivation and her/his attitude for the trans-disciplinary research in QST. Possessing an acceptable knowledge of quantum science and technology is mandatory for entering the Program. The Panel might accept candidates that do not completely fulfill this requirement, pending the acquisition of an appropriate number of credits from specific courses.

Students holding Q@TN Ph.D. fellowships do not need to include the motivation letter. They still need to present a formal application to the Program and the brief research proposal, specifying the title of the research project they have been selected for.

#### **Art. 2.2 - Co-advisor**

The admitted student, upon consulting with her/his advisor, proposes a co-advisor competent for the activity of interest for the Program to be approved by the Panel and by the Doctoral School Committee of the PhD School/Programme where the student is enrolled.

#### **Art. 2.3 - Proposals**

The brief research proposals presented by the candidates must address research targets relevant for the Program, and a feasible work plan for their achievements. The panel might appoint a referee for evaluating such proposals, either chosen among the members of the Panel or invited as an external additional member.



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The referee should evaluate the relevance, coherence and feasibility of the qualifying proposal, according to the up mentioned criteria. Students enrolled in the special Q@Tn Ph.D. are not subject to this evaluation step.

### Art. 2.4 Study Plan and Credits

Ph.D. candidates entering the Program are required to gain at least a total of **18 ECTS<sup>1</sup> credits** attending the following courses and sustaining the corresponding exams. This may include extra credits with respect to the Ph.D. School/Programme where the student is enrolled.

The credits in a typical study plan are distributed in the following way:

- **9 credits** are obtained attending the **fundamental courses** listed in the “Manifesto degli studi” concerning basic QST concepts
- **3 credits** are obtained following the courses listed in the Manifesto degli studi (emendable yearly by the panel), concerning topics of direct interest for the Program.
- **The remaining credits** can be obtained from any other admissible course according to the general rules of the Ph.D. School/Programme where the student is enrolled, which may also include Summer/Winter schools.

The various study plans must be approved by the Panel.

The credits related to the fundamental courses should be completed within the first year. The remaining credits can be completed during the second year. In any case all the credits must be registered no later than February 28th of the third year of the Program.

The Ph.D. candidates are also required to participate to the seminar and workshop events organized by the Q@TN consortium.

The panel is responsible for organizing the required additional specific courses compatibly with the existing activities offered by each Doctoral School/Programme.

### Art 2.5 - Progress Evaluation

At the end of each year, the Ph.D. candidate presents her/his work in front of the Panel. The Panel will release a statement evaluating the progress of the candidate with respect to her/his proposed research plan, and the overall scientific communication skills demonstrated during the talk.

### Art. 2.6 - Exclusion

The panel can decide to exclude the Ph.D. candidate from the Program in the following cases:

- a) failure to gain the required credits;
- b) negative evaluation of the research progress at the end of each year;
- c) at any time if the tutors report that the student is no longer following the research plan presented upon entering the Program.
- d) for any other reasons that make the student activities incompatible with the Program

Exclusion from the Program does not imply the exclusion from the Doctoral School/Programme where the student is enrolled, while exclusion from the Ph.D. School/Programme automatically implies exclusion from the Program.

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<sup>1</sup> The total number of credits to be earned will be the minimum between 18 and the number of credits required to accomply with the regulations of each Doctoral school plus six.



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**Art. 2.7 - Defense**

The refereeing process and the defense of the Ph.D. thesis will follow the rules for the candidates to the Ph.D. School/Programme where the student is enrolled. The referees and the members of the final Ph.D. Examination committee are proposed jointly by the advisor and the co-advisor. The evaluation should take into account also the transdisciplinary character of the research activity and of the results obtained by the candidate. Prior to the Ph.D. thesis defense and on the basis of the final report and the outcomes of the Ph.D. thesis review process, the Panel will propose the eligibility of the candidate to the "Expertus" title to the PhD School/Programme where the student is enrolled.

**Art. 2.8 - Title**

The transcript of records and the Diploma supplement of the University of Trento will mention that the Ph.D. "fulfilled the requirements of the Trans-disciplinary Program in Quantum Science and Technology. The thesis is an (excellent/good/relevant) contribution to the field of Quantum Science and Technologies and for this reason the candidate is appointed as an "Expertus" in Quantum Science and Technology". The title can be mentioned as: "*Ph.D. in ... , Expertus in Quantum Science and Technology*".

**Art. 2.9 - Duration**

The present regulation is valid for two academic years and its renewal must be approved by the Doctoral School committee of each PhD School/Programme.