



"Annex 4" updated on 2nd April 2019
(The updates are highlighted in red colour)

ANNEX 4

CALL FOR PHD POSITIONS – 35 cycle
PHD PROGRAMME IN PHYSICS

PhD Programme Coordinator	Prof. Paolo Gambino
Department	Physics
PhD Programme Length	3 years
PhD web site	http://dottorato.ph.unito.it/ http://dott-snti.campusnet.unito.it/do/home.pl/View?doc=indirizzi/fisica_e_astrofisica.htm
Course start date	1 st November 2019
Departments involved in PhD programme	Department of Physics

Positions offered by the PhD Programme¹

n. 16 positions with scholarship, of which n. 2 reserved to candidates with international qualifications	of which: -n. 7 scholarships funded by the university -n. 5 scholarship funded by the Department of Physics (under project "Dipartimenti di Eccellenza") -n. 2 scholarship funded by Istituto Nazionale di Fisica Nucleare/INFN -n. 1 scholarship funded by Istituto Nazionale di Fisica Nucleare/INFN and Department of Physics <i>- n.1 scholarship funded by INRIM (The awarding of the scholarship is subject to the formalization of the agreement with the funding Institution)</i>
n. 3 positions without scholarship	

¹ All additional scholarships and apprenticeship contracts (Legislative Decree no. 81/2015 art.45), which may become available after the publication of this Call, will be announced on the University websites <http://www.unito.it/ricerca/fare-ricerca-unito/dottorati-di-ricerca> and <http://en.unito.it/research/phd/phd-programmes> until Call's deadline.



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Titles of Research Projects / Research Fields

The list of research projects is available at the end of this PhD Programme's annex.

This list may be updated until Call's deadline.

Calendar of entrance examinations

The calendar with information on dates and venues of entrance examinations shall be published on the websites: <http://www.unito.it/ricerca/fare-ricerca-unito/dottorati-di-ricerca> and <http://en.unito.it/research/phd/phd-programmes> starting from **9th April 2019**.

Useful information for applicants

Application fee: €50.00 for each application submitted.

Candidates with international qualifications are exempted from paying the application fee.

Application fee deadline: 16th April 2019 (mandatory deadline).

Candidates who do not pay the application fee within the deadline will be excluded from the competition.

CALL FOR ALL POSITIONS

Admission procedure for all positions

Assessment of qualifications, research project and interview

Qualifications to be uploaded in the on-line application

- Application form (duly signed and including identification document/passport);
- For applicants with international qualifications: submit on-line documentation as specified in Art. 4 of this Call;
- For applicants under condition: provision of Bachelor's degree grade, certificate or self-certification with a complete list of academic transcripts concerning the 1st cycle degree (Laurea Triennale) and 2nd cycle degree (Laurea Magistrale) with marks, weighted average and credits. For applicants applying under condition, please also check Art. 5 of the Call.
- Research project (max 6000 characters, space and bibliography included) written in English by the candidate choosing among those listed by the Doctorate
- Abstract of Master Thesis
- Max 2 Letters of reference (as specified in Art. 5 of this Call)
- Publications (max 2)

Assessment criteria

maximum score 100 points

Assessment of qualifications:

Maximum score: 22 points

Final grade of Laurea (Laurea Ciclo Unico/unique cycle degree) or Degree of Laurea Magistrale/2nd cycle (60%) and Degree of Laurea Triennale/1st cycle (40%)

maximum score 10 points

110 lode: ____ 10 punti

110: _____ 9 punti



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<p>106-109: _____ 8 punti 100-105: _____ 7 punti < 100: _____ 6 punti</p> <p>For candidates applying under condition: weighted average of examinations results obtained during the Laurea Magistrale/2nd cycle degree (60%, table below) and Laurea Triennale/1st cycle degree (40% table above), or weighted average of list of examination of Laurea a Ciclo unico (unique cycle degree)</p> <p>> 29/30: _____ 10 punti tra 28 e 29/30 _____ 8 punti tra 27 e 28/30 _____ 7 punti <27/30 _____ 6 punti</p>	
<p>Publications:</p> <p>1 point for each (maximum 2 publications will be evaluated)</p>	<p>Maximum score 2 points</p>
<p>Other qualifications</p> <p>Second/additional master degree: 1 point</p> <p>Italian specialising master degree (1st and 2nd level degree) if relevant: 1 point Any other relevant specialisation: 1 point</p>	<p>maximum score 2 points</p>
<p>Maximum 2 recommendation letters by professors or qualified researchers</p>	<p>Maximum score 8 points</p>
<p>Research project</p>	<p>Maximum score 18 points</p>
<p><i>Minimum score for admission to the interview</i></p>	<p><i>24 points</i></p>
<p>Interview</p>	<p>Maximum score: 60 points</p>
<p><i>Minimum score for qualifying</i></p>	<p><i>36 points</i></p>
<p>Further information on the selection process</p> <p>The abstract of the Master Thesis, written in English, should include <u>no more than 800 characters</u> including spaces, and <u>very briefly</u> describe the purpose of the thesis, the methods used, and the results achieved, if any.</p> <p>The research project, written in English (max 6000 characters including spaces and bibliography), should belong to one of the research fields listed for the PhD program and should focus on the following points: state-of-the-art of the field; main goals of the project; proposed methodology.</p>	



The **interview** will focus on the research project and the relevant physics. The examining board will evaluate the scientific quality of the project, its feasibility during the 3 years of PhD, its goals, its possible impact. Upon request, the oral interview can take place using Skype (candidates should then specify their Skype contact in the Application form).

Working knowledge of English is mandatory.

**Titoli progetti di ricerca
Dottorato di Ricerca in Fisica
Titles of research projects
PhD Programme in Physics**

1. Astrofisica sperimentale da Terra e dallo spazio/ Ground- and space-based experimental astrophysics
2. Fisica dei plasmi astrofisici/ Astrophysical plasmas
3. Eliofisica e corpi minori del sistema solare/ Heliophysics and minor bodies of solar system
4. Esopianeti e planetologia/ Extrasolar planets and planetology
5. Evoluzione stellare e Via Lattea/ Stellar evolution and Milky Way
6. Galassie e cosmologia/ Galaxies and cosmology
7. Onde gravitazionali/ Gravitational waves
8. Ottica quantistica/ Quantum optics
9. Fisica del clima e dell'atmosfera/ Climate and atmospheric physics
10. Dinamica dei fluidi geofisici e oceanografia fisica/ Geophysical Fluid Dynamics and Physical Oceanography
11. Fisica dei neutroni/ Neutron Physics
12. Fisica dei raggi cosmici/ Cosmic rays
13. Fisica nucleare sperimentale/Experimental nuclear physics
14. Fisica sperimentale del quark-gluon plasma/Experimental quark-gluon plasma physics
15. Fisica sperimentale delle particelle elementari/Experimental high energy physics
16. –Elettronica, microelettronica e nuove tecnologie per rivelatori di particelle/ Design of electronics and microelectronics and new technologies for particle detectors



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17. Fisica medica/ Medical physics
18. Fisica dei beni culturali/ Cultural heritage physics
19. Nuovi materiali e micro/nano-dispositivi innovativi/ Novel materials and micro/nano-devices
20. Sistemi dinamici, turbolenza e onde nonlineari/ Dynamical systems, turbulence and nonlinear waves
21. Modelli fisici per sistemi biologici/ Physical modelling of biological systems
22. Teoria dei campi su reticolo e modelli integrabili/ Lattice field theory and integrable models
23. Fisica teorica astroparticellare/ Theoretical astroparticle physics
24. Teoria della stringa e supergravità/ String theory and supergravity
25. Fisica teorica dei nuclei e del quark-gluon plasma / Nuclear theory and quark-gluon plasma physics
26. Fenomenologia delle particelle elementari/ Phenomenology of elementary particles
27. Didattica e storia della fisica/Physics education and history of physics
28. Sviluppo di rivelatori monolitici a pixel di silicio per tracciatori di particelle cariche/ Development of monolithic silicon pixel detectors for charged particle trackers (S. Beolè) (titolo abbinato alla borsa finanziata dal Dipartimento di Fisica nell'ambito del progetto Dipartimenti di Eccellenza / research project linked to the scholarship funded by "Dipartimento di Fisica" under project "Dipartimenti di eccellenza")
29. Sviluppo di rivelatori al silicio Ultra Fast per misure precise di timing a LHC/ Development of Ultra Fast Silicon Detector for precise timing at LHC (M. Costa)) (titolo abbinato alla borsa finanziata dal Dipartimento di Fisica nell'ambito del progetto Dipartimenti di Eccellenza / research project linked to the scholarship funded by "Dipartimento di Fisica" under project "Dipartimenti di eccellenza")
30. Sviluppo teorico di modelli per la ricerca di materia oscura in sistemi con sottoaloni/ Theoretical developments of models for dark matter searches in systems with sub-haloes (F. Donato) (titolo abbinato alla borsa finanziata dal Dipartimento di Fisica nell'ambito del progetto Dipartimenti di Eccellenza / research project linked to the scholarship funded by "Dipartimento di Fisica" under project "Dipartimenti di eccellenza")
31. Analisi statistica dell'emissione radio di bassa frequenza, osservabile con il radio telescopio LOFAR, di campioni di radio galassie "Wide angle tailed"/ Statistical analysis of the low-frequency radio emission, observable with the LOFAR radiotelescope, of "Wide angle tailed" radio galaxy samples (F. Massaro) (titolo abbinato alla borsa finanziata dal Dipartimento di Fisica nell'ambito del



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progetto Dipartimenti di Eccellenza / research project linked to the scholarship funded by "Dipartimento di Fisica" under project "Dipartimenti di eccellenza")

32. Caos e turbolenza in fluidi complessi/ Chaos and turbulence in complex fluids (S. Musacchio)
(titolo abbinato alla borsa finanziata dal Dipartimento di Fisica nell'ambito del progetto Dipartimenti di Eccellenza / research project linked to the scholarship funded by "Dipartimento di Fisica" under project "Dipartimenti di eccellenza")

33. Meteorites recovery and orbital elements of Near Earth Objects from observations of bright meteors: scientific exploitation of the PRISMA fireball network data and of the missions of the JEM-EUSO program. (titolo abbinato alla borsa cofinanziata da INAF e dal Dipartimento di Fisica/ research project linked to the scholarship funded by INAF and "Dipartimento di Fisica")

34. *Misure per le tecnologie fotoniche quantistiche. (titolo di progetto abbinato alla borsa finanziata da INRIM / research project linked to the scholarship funded by INRIM)*