Ph.D course in Astrophysics

Head of the Ph.D course: Prof. Carlo Baccigalupi
Web site: Astrophysics

Research lines:
- Early Universe Physics
- Galaxies
- Stellar Evolution
- Gravitation Theory
- High Energy Astrophysics
- Large Scale Structure
- Relativistic Astrophysics

Fellowships available: 5
Admission: Academic and scientific qualifications + oral exam
Beginning of the Courses: 5 November, 2018

<table>
<thead>
<tr>
<th>Evaluation of academic and scientific qualifications:</th>
<th>30 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Oral Exam:</td>
<td>minimum mark of 21/30 in the academic and scientific qualifications evaluation up to a maximum of 15 admitted candidates.</td>
</tr>
<tr>
<td>Evaluation of Oral Exam:</td>
<td>70 points</td>
</tr>
<tr>
<td>Total Evaluation:</td>
<td>100 points</td>
</tr>
<tr>
<td>Eligibility:</td>
<td>70 points</td>
</tr>
</tbody>
</table>

First Session
Deadline for online submission of applications: 30 March, 2018
Oral Exam: 18 and 19 April, 2018.

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 31 August 2018

Admission to the oral exam and results of all evaluations will be notified by email.
Ph.D course in Astroparticle Physics

Head of the Ph.D course: Prof. Piero Ullio
Web site: [Astroparticle Physics](#)

Research lines:
- Classical and Quantum Gravity
- Early Universe Cosmology
- The Dark Universe
- Cosmic rays and Particle Astrophysics
- Gravitational Waves

Fellowships available: 5
Admission: Academic and scientific qualifications + written exam + oral exam
Beginning of the Courses: 1 October, 2018

| Evaluation of academic and scientific qualifications: 10 points |
| Access to Written Exam: minimum mark of 7/10 on academic and scientific qualifications |
| Evaluation of Written Exam: 40 points |
| Access to Oral Exam: minimum mark of 28/40 in the written exam evaluation |
| Evaluation of Oral Exam: 50 points |
| Total Evaluation: 100 points |
| Eligibility: 70 points |

First Session
Deadline for online submission of applications: 7 March, 2018
Written Exam: 20 March, 2018
Oral Exam: 21 March, 2018

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 15 June, 2018
Written Exam: 4 July, 2018
Oral Exam: 5 July, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Cognitive Neuroscience

Head of the Ph.D course: Prof. Davide Crepaldi
Web site: Cognitive Neuroscience

Research lines:
- Visual perception
- Time perception
- Tactile perception
- Language, reading, and statistical learning
- Reward and social neuroscience
- Neural computation, with emphasis on language and spatial navigation
- Hierarchical Bayesian inference, learning, and action in the brain

Fellowships available: 8
Admission: Academic and scientific qualifications + written exam + oral exam
Beginning of the Courses: 5 November, 2018

| Evaluation of academic and scientific qualifications: 10 points |
| Access to Written Exam: minimum mark of 7/10 on academic and scientific qualifications |
| Evaluation of Written Exam: 40 points |
| Access to Oral Exam: minimum mark of 28/40 in the written exam evaluation |
| Evaluation of Oral Exam: 50 points |
| Total Evaluation: 100 points |
| Eligibility: 70 points |

First Session
Deadline for online submission of applications: 2 March, 2018
Written Exam: 16 April, 2018
Oral Exam: 17 April, 2018

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 31 August, 2018
Written Exam: 13 September, 2018
Oral Exam: 14 September, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Functional and Structural Genomics

Head of the Ph.D course: Prof. Antonello Mallamaci
Web site: Functional and Structural Genomics

Research lines:
- Neurogenomics
- Cerebral Cortex Development
- Prion Biology
- Functional Genomics (including Scalable engineering of gene expression)
- Neurodegeneration
- Parkinson's Disease
- Structural Biology
- Drug Discovery
- Bioinformatics (including Molecular dynamics and simulation)
- Evolutionary Genomics
- Comparative Genomics
- Population Genomics

Fellowships available: 4
Admission: Academic and scientific qualifications + written exam + oral exam
Beginning of the Courses: 5 November, 2018

<table>
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<tr>
<th>Evaluation of academic and scientific qualifications: 10 points</th>
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<td>Evaluation of Oral Exam: 50 points</td>
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<td>Total Evaluation: 100 points</td>
</tr>
<tr>
<td>Eligibility: 70 points</td>
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</table>

First Session
Deadline for online submission of applications: 2 March, 2018

Written Exam: 3 May, 2018
Oral Exam: 4 May, 2018

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 31 August, 2018

Written Exam: 13 September, 2018
Oral Exam: 14 September, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Geometry and Mathematical Physics

Head of the Ph.D course: Prof. Alessandro Tanzini
Web site: Geometry and Mathematical Physics

Research lines:
- Integrable systems, and their applications in Mathematical Physics and Geometry
- Noncommutative geometry (bundles, connections, quantum groups)
- Mathematical aspects of Quantum Field Theory and String Theory
- Mathematical Methods of quantum mechanics
- Algebraic geometry (deformation theory, moduli spaces, invariants)

Fellowships available: 8
Admission: Academic and scientific qualifications + written exam + oral exam
Beginning of the Courses: 1 October, 2018

| Evaluation of academic and scientific qualifications: 10 points |
| Access to Written Exam: minimum mark of 7/10 on academic and scientific qualifications |
| Evaluation of Written Exam: 40 points |
| Access to Oral Exam: minimum mark of 28/40 in the written exam evaluation |
| Evaluation of Oral Exam: 50 points |
| Total Evaluation: 100 points |
| Eligibility: 70 points |

First Session

Deadline for online submission of applications: 13 March, 2018
Written Exam: 20 March, 2018
Oral Exam: 21 March, 2018

Second Session (only if there should still be places available after the first one)

Deadline for online submission of applications: 31 August, 2018
Written Exam: 12 September, 2018
Oral Exam: 13 September, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Mathematical Analysis, Modelling, and Applications

Head of the Ph.D course: Prof. Massimiliano Berti

Web site: Mathematical Analysis, Modelling, and Applications

Research lines:
- Conservation laws
- Transport problems
- Geometric PDEs
- Nonlinear analysis
- Dynamical systems
- Calculus of variations
- Gamma-convergence and multiscale analysis
- Rate independent evolution problems
- Geometric control theory
- Sub-Riemannian geometry
- Inelastic behavior of solids: plasticity, damage, fracture
- Mechanobiology of the cell and cell motility
- Mechanics of soft and active materials
- Reduced basis methods
- Boundary integral methods and isogeometric analysis
- Fluid-structure interaction problems

Fellowships available: 8

Admission: Academic and scientific qualifications + written exam + oral exam

Beginning of the Courses: 1 October, 2018

Evaluation of academic and scientific qualifications: 10 points

Access to Written Exam: minimum mark of 7/10 on academic and scientific qualifications

Evaluation of Written Exam: 40 points

Access to Oral Exam: minimum mark of 28/40 in the written exam evaluation

Evaluation of Oral Exam: 50 points

Total Evaluation: 100 points

Eligibility: 70 points

First Session

Deadline for online submission of applications: 30 March, 2018

Written Exam: 12 April, 2018
Oral Exam: 13 April, 2018

Second Session (only if there should still be places available after the first one)

Deadline for online submission of applications: 22 August, 2018

Written Exam: 5 September, 2018
Oral Exam: 6 September, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Molecular Biology

Head of the Ph.D course: Prof. Giuseppe Legname
Web site: Molecular Biology

Research lines:
- Molecular Biology of Cells
- Developmental Biology
- Plant biology
- Structural Biology of Proteins and Nucleic Acids
- Genomics
- Molecular Oncology
- Molecular Cardiology
- Molecular Mechanisms of Neurodegeneration
- Molecular Virology
- RNA therapeutics
- Drug Discovery
- DNA damage
- Molecular and Cellular Immunology

Fellowships available: 5 (1 financed by SISSA, 1 by the University of Udine, 1 by the University of Trieste and 2 by ICGEB - Trieste)

Admission: Academic and scientific qualifications + oral exam (also by videoconference)

Beginning of the Courses: 5 November, 2018

<table>
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</table>

Single Session

Deadline for online submission of applications: 31 August 2018

Oral Exams: 20 and 21 September, 2018

Candidates admitted to the oral exam will be notified by email by 15 September 2018. The results of the oral exams and the final ranking will be notified by email.
Head of the Ph.D course: Prof. Anna Menini
Web site: Neurobiology

Research lines:
- Somatosensation
- Peripheral Nervous System
- Olfactory Systems and Ion Channels
- Synaptic Neurophysiology and Neuronal Networks
- Bionanotechnology
- New Materials and Neurons
- Neurophysiology of Motor control
- Spinal networks patho-physiology and locomotion
- Interfaces to simultaneously stimulate and record signals from the spinal cord

Fellowships available: 7
Admission: Academic and scientific qualifications + oral exam
Beginning of the Courses: 5 November, 2018

Evaluation of academic and scientific qualifications: 30 points
 Besides the documents mentioned in the general part of the announcement, all applicants must provide a written essay in English, describing their previous academic background and scientific motivations to pursue a SISSA PhD and including a short list of theses projects among those available (see above list).
The essay (about 3 pages long) will be used for an initial screening of suitable candidates to be invited to the oral exam.

Access to Oral Exam: minimum mark of 21/30 on academic and scientific qualifications

Evaluation of Oral Exam: 70 points

Total Evaluation: 100 points

Eligibility: 70 points

Single Session

Deadline for online submission of applications: 3 September 2018

Oral Exams: 26 and 27 September, 2018

Candidates admitted to the oral exam will be notified by email by 17 September 2018. The results of the oral exams and the final ranking will be notified by email.
Ph.D course in Physics and Chemistry of the Biological Systems

Head of the Ph.D course: Prof. Giovanni Bussi
Web site: Physics and Chemistry of the Biological Systems

Research lines:
- Algorithm development for biomolecular simulations
- Algorithm development for data mining
- Atomistic simulations of drugs interacting with proteins and nucleic acids
- Kinetics, mechanics and entanglement of biopolymers: atomistic and coarse-grained approaches
- Modeling and simulation of cellular motility
- Rational drug design
- Systems Biology

Fellowships available: 5
Admission: Academic and scientific qualifications + written exam + oral exam
Beginning of the Courses: 5 November, 2018

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<td>and scientific qualifications evaluation up to a maximum of</td>
</tr>
<tr>
<td>12 admitted candidates</td>
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First Session
Deadline for online submission of applications: 12 March, 2018
Written Exam: 26 March, 2018
Oral Exam: 27 March, 2018

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 31 August, 2018
Written Exam: 17 September, 2018
Oral Exam: 18 September, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Statistical Physics

Head of the Ph.D course: Prof. Pasquale Calabrese
Web site: Statistical Physics

Research lines:
- Statistical Field Theories and Applications
- Exactly Solved Models of Statistical Mechanics
- Classical and Quantum Statistical Physics out of Equilibrium
- Cold Atoms
- Quantum Quenches
- Entanglement in many-body systems
- Quantum Integrable Models
- Quantum Systems with Disorder
- Complex Systems
- Critical phenomena and renormalization group
- Two-dimensional conformal field theories

Fellowships available: 5
Admission: Academic and scientific qualifications + oral exam (also by videoconference)
Beginning of the Courses: 5 November, 2018

| Evaluation of academic and scientific qualifications: 30 points |
| Access to Oral Exam: minimum mark of 21/30 on academic and scientific qualifications |
| Evaluation of Oral Exam: 70 points |
| Total Evaluation: 100 points |
| Eligibility: 70 points |

First Session
Deadline for online submission of applications: 15 March, 2018
Oral Exam: 26 to 29 March, 2018
The results of the academic and scientific qualifications evaluation will be notified by email by 21 March 2018. Selected candidates will be informed about day and time of the oral exam that, on demand, could be taken by videoconference, preferably through “Skype” (see general announcement).

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 22 August, 2018
Oral Exam: 3 to 7 September, 2018
The results of the academic and scientific qualifications evaluation will be notified by email by 28 August. Selected candidates will be informed about day and time of the oral exam that, on demand, could be taken by videoconference, preferably through “Skype” (see general announcement).

The results of the oral exams and the final ranking will be notified by email.
Ph.D course in Theoretical Particle Physics

Head of the Ph.D course: Prof. Marco Serone
Web site: Theoretical Particle Physics

Research lines:
- String Theory, AdS/CFT duality and applications
- Supersymmetric Field Theories
- Conformal Field Theories
- Quantum Gravity
- Physics beyond the Standard Model
- Physics at the LHC
- Neutrino and Flavour Physics

Fellowships available: 5
Admission: Academic and scientific qualifications + written exam + oral exam
Beginning of the Courses: 1 October, 2018

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Access to Written Exam: minimum mark of 7/10 on academic and scientific qualifications

Evaluation of Written Exam: 40 points

Access to Oral Exam: minimum mark of 28/40 in the written exam evaluation

Evaluation of Oral Exam: 50 points

Total Evaluation: 100 points

Eligibility: 70 points

First Session

Deadline for online submission of applications: 7 March, 2018

Written Exam: 22 March, 2018
Oral Exam: 23 March, 2018

Second Session (only if there should still be places available after the first one)

Deadline for online submission of applications: 15 June, 2018

Written Exam: 2 July, 2018
Oral Exam: 3 July, 2018

Admission to the written exam and results of all evaluations will be notified by email.
Ph.D course in Theory and Numerical Simulation on the Condensed Matter

Head of the Ph.D course: Prof. Sandro Sorella
Web site: Theory and Numerical Simulation on the Condensed Matter

Research lines:
- Strongly correlated systems in and out of equilibrium.
- Quantum modeling of materials at the nanoscale.
- Quantum Monte Carlo simulations of strongly correlated systems and materials science

Fellowships available: 8
Admission: Academic and scientific qualifications + oral exam (also by videoconference)
Beginning of the Courses: 5 November, 2018

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<td>Eligibility:</td>
<td>70 points</td>
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</tbody>
</table>

First Session
Deadline for online submission of applications: 15 March, 2018

Oral Exam: from 26 to 29 April, 2018
The results of the academic and scientific qualifications evaluation will be notified by email by 21 March. Selected candidates will be informed about day and time of the oral exam that, upon request, could be taken by videoconference, preferably through “Skype” (see general announcement).

Second Session (only if there should still be places available after the first one)
Deadline for online submission of applications: 10 September, 2018

Oral Exam: 24 and 25 September, 2018
The results of the academic and scientific qualifications evaluation will be notified by email by 17 September. Selected candidates will be informed about day and time of the oral exam that, on demand, could be taken by videoconference, preferably through “Skype” (see general announcement).

The results of the oral exams and the final ranking will be notified by email.