

PhD in Physics University of Trieste

XXXVIII Cycle

Nuclear, Particle and Astroparticle Physics Courses

| Course Name | Lecturer | Hours | Quando |
|--|---|--------|-----------------------|
| Flavour Physics beyond the Standard Model. Concepts and Experimental | D. Tonelli (INFN) / Mirco Dorigo (INFN) | 16 | Inverno 2022/2023 |
| Introduction to Bayesian Methods | E. Milotti (UNITS) | 16 | Primavera 2023 |
| Experimental Tests of the Standard Model | F. Cossutti (INFN) | 16 | Primavera 2023 |
| Models and methods for beyond Standard Model Physics at colliders | V.Candelise (UNITS) | 8 | Primavera 2023 |
| Silicon detectors and Readout electronics | V. Bonvicini (INFN), R. Longo (UNITS) | 16 | Inverno 2022/2023 |
| Introduction to RooFit | M. Pinamonti (INFN) | 16 | Primavera/Estate 2023 |
| The physics of imaging with x-rays and associated x-ray detectors | R. H. Menk (Elettra), L.Brombal (INFN) | 16 + 8 | Primavera 2023 |
| Cosmic Rays and Gamma-ray Astrophysics | R.Munini (INFN), F.Longo (UNITS) | 16 | Primavera 2023 |
| Radiation-Matter interaction simulation with Geant4 | F. Longo (UNITS) V.Zaccolo (UNITS) | 16 + 8 | Primavera/Estate 2023 |
| The Dark Sector beyond the Standard Model: experiments and concepts | G. Cantatore (UNITS) | 16 | Autunno 2023 |
| Advanced data analysis techniques with machine and deep learning | G. Luparello (INFN) | 16 | Primavera 2023 |
| QCD matter at extreme conditions | E. Fragiaco (INFN) | 8 | Primavera 2023 |
| Quark-Gluon Plasma: theory and experimental observables | E. Fragiaco (INFN) | 8 | Primavera 2023 |
| The QCD structure of the Nucleon | F. Bradamante (INFN) | 16 | Primavera 2023 |
| The 3D structure of the Nucleon | A. Martin (UNITS) | 16 | Primavera 2023 |

Theoretical Physics Courses

| Course Name | Lecturer | Hours | Quando |
|--|-----------------------------------|-------|-------------------|
| Advanced topics in quantum field theory | R.Valandro e L. Di Pietro (UNITS) | 24 | Primavera 2023 |
| Advanced quantum mechanics and selected applications to quantum computation | S.Donadi (INFN) | 12 | Primavera 2023 |
| Foundations of Quantum Mechanics | TBD | 32 | Inverno 2022/2023 |
| Statistical Field Theory | A.Trombettoni (UNITS) | 20 | Primavera 2023 |
| Complete positivity in quantum information | F. Benatti (UNITS) | 12 | Estate 2023 |
| Introduction to Clifford algebra and spinors | M. Budinich (UNITS) | 24 | Inverno 2022/2023 |
| The Standard Model theory: an updated review on the Higgs boson physics, Flavor physics and CP violating phenomena | E. Gabrielli (UNITS) | 16 | Autunno 2023 |

Astrophysics Courses

| Course Name | Lecturer | Hours | Quando |
|---|--|-------|----------------------|
| Formation of Cosmic Structures | S.Borgani (UNITS), M.Costanzi (UNITS) | 24 | Inverno 2022/2023 |
| Gamma Ray Bursts: observations and theoretical implications | F.Longo (UNITS) | 8 | Primavera 2023 |
| Intergalactic Medium | S. Cristiani (INAF) | 12 | Primavera 2023 |
| Active Galactic Nuclei | F. Fiore (INAF) | 12 | Primavera 2023 |
| Galactic Archaeology in the Era of Large Surveys | F. Matteucci (UNITS) | 10 | Primavera 2023 |
| Galaxy Formation | P. Monaco (UNITS), G. De Lucia (INAF) | 16 | Primavera 2023 |
| Large Scale Structure | E. Sefusatti (INAF) | 18 | Primavera 2023 |
| Meteorology of Space: From the Universe to the Geosphere | A.Gregorio (UNITS), M.Messerotti (INAF) | 24 | Estate 2023 |

Condensed Matter Courses

| Title | Lecturer | Hours | Quando |
|--|---|--------|------------------------|
| Low-temperature physics: quantum fluids and superconductivity | F. Becca (UNITS) | 16 | Primavera 2023 |
| Free electron laser and synchrotron-based spectroscopies: getting to the nanometer with femtosecond resolution | C. Masciovecchio (Elettra) | 20 | Inverno 2022 / 2023 |
| Principles of functioning of the FEL | L. Giannessi (Elettra) | 12 | Estate 2023 |
| Advanced Spectroscopy of Solids (I+II) | F.Parmigiani (Elettra) | 32 + 8 | Autunno 2023 |
| Introduction to Density Functional Theory | M.Peressi (UNITS) | 8 | Primavera 2021 |
| The physics of imaging with x-rays and associated x-ray detectors | R. H. Menk (Elettra), L.Brombal (INFN) | 16 + 8 | Primavera 2023 |
| Imaging with X-rays - fundamentals and applications | P. Thibault (UNITS) | 8 | Primavera 2023 |