

Master degree in Physics

Open day

19-03-2026

Curriculum A – Theoretical Physics

Curriculum B – Particle Physics and Applied Physics

Curriculum C – Physics of Matter

Why a Master Degree in Physics @Bicocca

Provides a solid cultural and methodological foundation in **Physics**, preparing graduates for:

- ✓ Professional careers as physicists
- ✓ Employment in companies
- ✓ Research
- ✓ Teaching and science communication

- **Curriculum Tracks**

A) **Theoretical Physics** – Focus on theoretical foundations and fundamental physics

B) **Particle Physics & Applied Physics** – Emphasis on experimental and applied physics

C) **Physics of Matter** – Specialization in microphysics and material structure

Educational Objectives

The Master's Degree in Physics provides **advanced training** in fundamental and applied physics. The program aims to develop:

- ✓ Expertise in modelling and experimental validation of physical phenomena
- ✓ Mastery of advanced **mathematical** and **computational tools**
- ✓ In-depth knowledge of **measurement instrumentation** and **data analysis techniques**
- ✓ Ability to work in **multidisciplinary contexts**
- ✓ Independent study and knowledge integration skills
- ✓ Research planning and execution skills

Professional Profile and Career Opportunities

Graduates can work in:

- ✓ High-tech industries (microelectronics, telecommunications, IT, space, biomedical, optics)
- ✓ Environmental, healthcare, cultural heritage, and public administration sectors
- ✓ Public and private research institutions
- ✓ Finance, banking, and consulting firms (data modelling)
- ✓ Science communication and education

Consider continuing into a **PHD program** <https://www.fisica.unimib.it/it/didattica/dottorato>

Employment data

Summary of Almalaurea Data: Calendar Year 2023

Survey Sample: 71 respondents out of 76 graduates.

Employment Rate:

- **93.3%** employed one year after graduation.
- **88%** employed three years after graduation.
- **96.2%** employed five years after graduation.

Use of Degree-Acquired Skills in Work:

- **66.7%** (after 1 year), **63.6%** (after 3 years), and **68%** (after 5 years) report a high utilization of skills acquired during their studies.

Average Net Monthly Salary:

- **€1,494** one year after graduation.
- **€1,643** three years after graduation.
- **€2,093** five years after graduation.

Job Satisfaction (Scale 1-10):

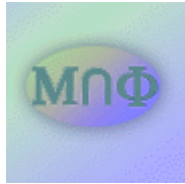
- **8.1** (after 1 year), **8.1** (after 3 years), **8.4** (after 5 years).

Why should you go for the Physics Master program
@Bicocca?

....also because we do great research here!

Consult the Department web page;
<https://www.fisica.unimib.it/en/research/research>

Research groups in the Physics department



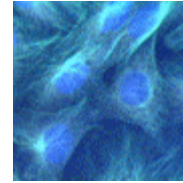
Theoretical Physics



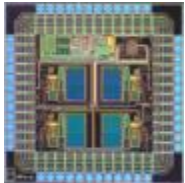
Particle Physics



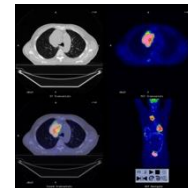
Plasma Physics



Biophysics/Biophotonic



Electronics



Applied Physics

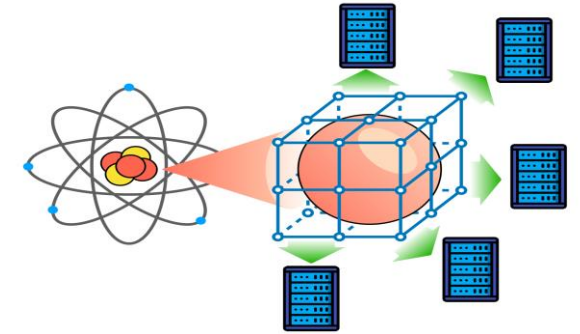
+ researchers of Material Science department for Solid State Physics

+ researchers in the Astrophysics group

THEORETICAL PHYSICS

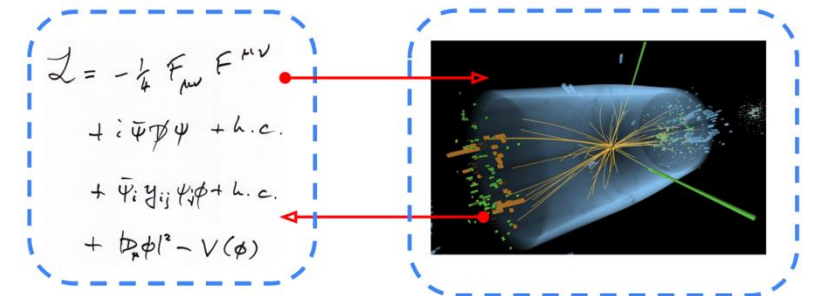
Lattice Group: Study of the properties of the fundamental constituents of matter and their interactions through numerical simulations on supercomputers

Members: M. Bruno, M. Ce`, M. Dallabrida, L. Giusti, F. Rapuano + M. Pepe (INFN)



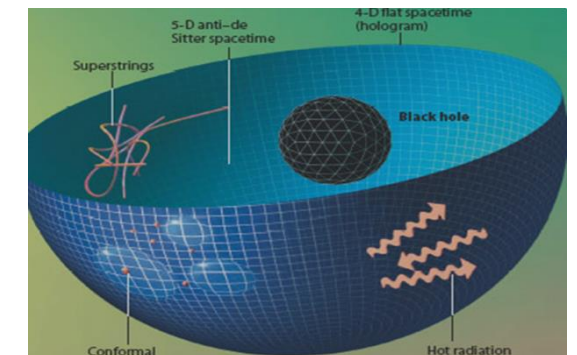
Collider phenomenology group: we calculate cross sections with high accuracy at current and future colliders using advanced **perturbative quantum field theory** techniques.

Members : S. Alioli, C. Oleari, E. Re, L. Rottoli







String theory group: we study fundamental interactions focusing on quantum field theory, quantum gravity and the AdS/CFT correspondence.

Members : A. Belin, S. Pasquetti, S. Penati, A. Zaffaroni + A. Tomasiello (Maths), N. Mekareeya (INFN)



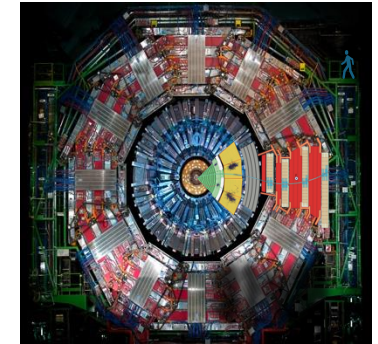
PHYSICS AT PARTICLES' COLLIDERS

Pushing the Frontiers of High-Energy Physics at the LHC

-  Cutting-edge research at the **Large Hadron Collider (LHC)** at **CERN, Geneva**, unraveling the fundamental building blocks of the universe.
-  Advancing hardware and software innovation for particle detection and data analysis, leveraging machine learning, heterogeneous computing on GPUs and FPGAs, electronics, and quantum machine learning to unlock new physics.
-  Mentoring the next generation of physicists through **thesis supervision** in a **competitive, international, and multicultural** research environment.
-  Strong collaboration with the Istituto Nazionale di Fisica Nucleare (INFN), driving groundbreaking scientific and technological advancements in high-energy physics.

CMS (Compact Muon Solenoid)

- A **Multi-purpose detector** with hermetic coverage of the full solid angle around the interaction point, enabling the study of a wide range of proton collision processes
- The **Milano-Bicocca group** is actively involved in the **Electroweak sector of the Standard Model**, focusing on **vector boson interaction, Higgs boson production, and flavor physics**.
- Contributions to the **R&D and construction** of key CMS subdetectors, including **electromagnetic calorimeter, pixel-based tracker, MIP timing detector**
- Team: **Andrea Benaglia, Federico De Guio, Mauro Dinardo, Paolo Dini, Simone Gennai, Raffaele Gerosa, Alessio Ghezzi, Pietro Govoni, Marco Lucchini, Martina Malberti, Sandra Malvezzi, Andrea Massironi, Luigi Moroni, Marco Paganoni, Daniele Pedrini, Stefano Ragazzi, Tommaso Tabarelli de Fatis**



LHCb: Unveiling New Physics Through Heavy Quark Decays

- A dedicated **flavor physics experiment** at the LHC, exploring heavy quark decays with **unprecedented precision** to uncover new phenomena.
- The **Milano-Bicocca group** leads the search for **physics beyond the Standard Model** in **semileptonic B decays** and **multibody charm meson (D0) decays**.
- Active in the **R&D and construction** of key LHCb subdetectors, including **RICH** and the **electromagnetic calorimeter**, crucial for high-precision measurements.
- Team: **Martino Borsato, Marta Calvi, Maurizio Martinelli, Alessandro Minotti, Marco Pizzichemi**

NEUTRINO PHYSICS

- **Interdisciplinary field** with connections ranging from astrophysics to nuclear physics and solid-state physics.
- **Technology development in synergy** with other sectors (e.g., cryogenic superconducting sensors).
- **Thesis work in a stimulating and international environment.**

Neutrinos from accelerators

ENuBet: Development of an instrumented decay tunnel for the production and monitoring of neutrino beams @CERN

F. Terranova, A. Branca, C. Brizzolari, G. Brunetti, C. Cattadori, M. Delgado, C. Gotti, A. Falcone, D. Guffanti, A. Minotti, M. Torti

DUNE: 3(4)× 17kton LAr-TPC for the measurement of the oscillation parameters (δ_{CP} , MH), astrophysical neutrinos. Development of cryogenic light detectors for LArTPC; development of simulations, advanced reconstruction techniques.

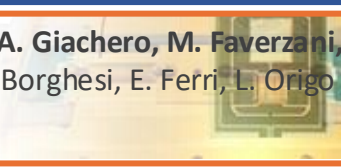


Cryogenic sensors for neutrino physics:

A. Nucciotti, A. Giachero, M. Faverzani,

HOLMES: Direct measurement of the neutrino mass with superconducting cryogenic detectors M. Borghesi, E. Ferri, L. Origo

PTOLEMY: Measurement of primordial neutrinos through capture on ^3H implanted on graphene.

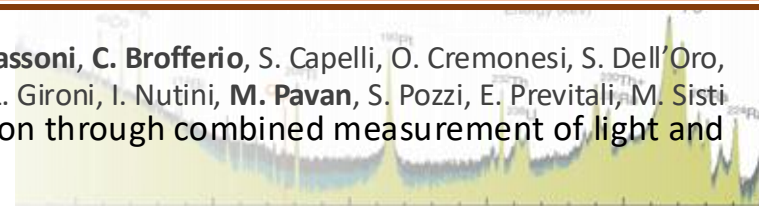


Search for $0\nu\beta\beta$ decay: the Majorana nature of the neutrino

CUORE/CUPID: Search for $0\nu\beta\beta$ decay in bolometers

M. Biassoni, C. Brofferio, S. Capelli, O. Cremonesi, S. Dell'Oro, E. Ferri, L. Gironi, I. Nutini, M. Pavan, S. Pozzi, E. Previtali, M. Sisti

Development of scintillating bolometers for α background discrimination through combined measurement of light and thermal signal.



LEGEND: Search for $0\nu\beta\beta$ in HPGe detectors enriched in ^{76}Ge

C. Cattadori

Search for the sterile neutrino:

M. Biassoni, O. Cremonesi, A. Nava, M. Pavan, S. Pozzi

TRISTAN: precision measurement of the decay spectrum of ^3H . Search for distortions induced by the mass of sterile ν .

Neutrinos from reactors

M. Sisti, D. Chiesa, E. Previtali, A. Barresi, M. Borghesi, M. Nastasi

JUNO: Precision measurement of reactor ν oscillations, determination of mass hierarchy.

Astroparticles :

L. Pattavina, M. Clemenza, M. Consonni, N. Ferreiro Iachellini, G. Pessina

RES-NOVA (res-nova.unimib.it): Innovative cryogenic detectors made with archaeological Pb for the search of interactions at low energies (eV-scale), produced by astrophysical neutrino sources (Supernovae, Sun, etc.) and Dark Matter.

PLASMA PHYSICS

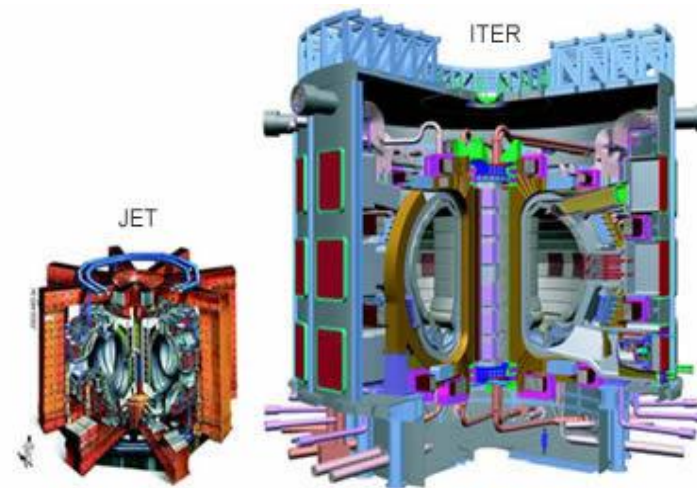
Controlled Thermonuclear Fusion

(Cavedon, Croci, Gorini, Nocente)

A scientific challenge

An engineering challenge

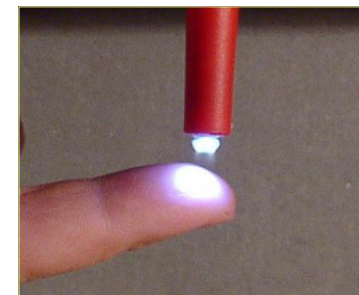
A social challenge



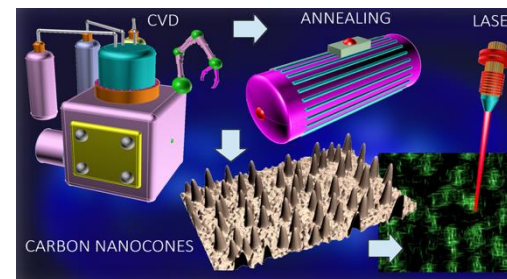
Plasma Applications

(Barni, Martines, Riccardi)

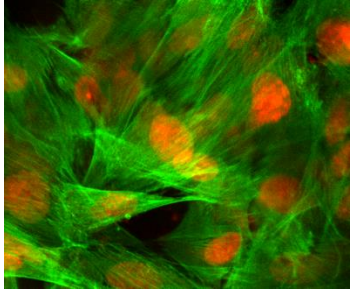
Phenomenology of electrical discharges in gases



Materials, Environment, Medicine



Biophysics and biophotonics



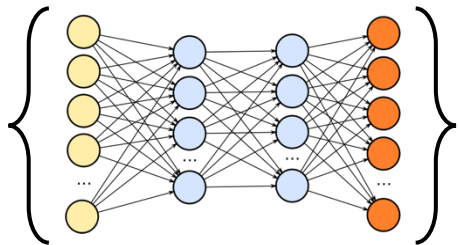
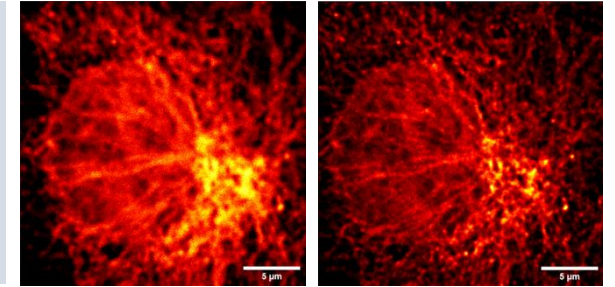
Non-linear-excitation fluorescence microscopy

Development of image acquisition and processing methods for optical non-linear microscopy based on two-photon-excited fluorescence and second harmonic generation signals

→ Application to the characterization of bio-implants in vivo (FET European project “In2sight”)

Development of optical imaging techniques

- Super-resolution fluorescence imaging by Image Scanning Microscopy (ISM) on SPAD array detectors
- Super-resolution far-infrared temperature-based imaging
- Adaptive optics / scattering correction

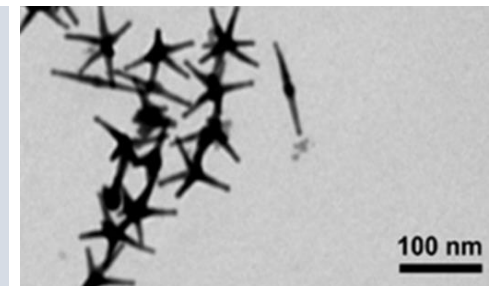


Artificial intelligence for digital pathology and medical imaging

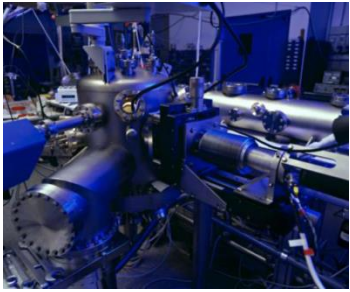
- AI-based image segmentation and processing methods for digital pathology and clinical applications
- Modelling and agent-based simulation of the immune system response and activation

Laser microfabrication and nanotechnology for biophysical/biomedical applications

- Development and fabrication of protein-based microstructured hydrogels for cell culture and tissue engineering
- Photo-thermal and photo-luminescent nanostructured devices for photo-thermal therapy and cell stimulation

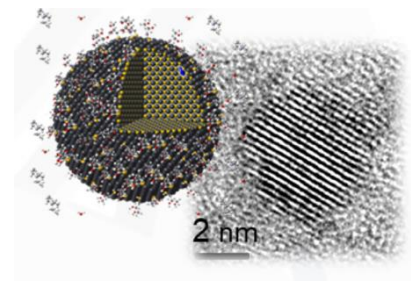


Solid State Physics



An incomplete list of research activities at the Department of Materials Science

<https://www.mater.unimib.it/en/research/research-areas>



- Spectroscopy of semiconductors for microelectronics and optoelectronics; spin physics in nanostructures for spintronics and quantum computing (E. Bonera, M. Fanciulli, F. Moro, F. Pezzoli)
- Materials synthesis by Molecular Beam Epitaxy: organic semiconductors (A. Sassella), inorganic semiconductors and materials for quantum technologies (S. Cecchi, S. Sanguinetti)
- Spectroscopy of scintillator materials for radiation detectors and radiotherapy (M. Fasoli, R. Lorenzi, A. Monguzzi, A. Paleari, A. Vedda)
- Materials and devices for photovoltaics applications (M. Acciarri)
- Atomistic, mesoscopic and machine learning simulations of semiconductors for microelectronics and neuromorphic computing and of multiferroic materials (M. Bernasconi, R. Bergamaschini, L. Miglio, F. Montalenti, S. Picozzi, E. Scalise)
- Ultrafast microscopy of dynamical phenomena at the nanoscale (G. Vanacore)
- Analysis of materials for cultural heritage (A. Galli)

Microelectronics

Staff: Andrea Baschirotto, Marcello De Matteis, Valeria Vadalà

Elia Vallicelli, Adeel Sayed, Mattia Tambaro, Federico D'Aniello, Gianni Bosi, Ciro Esposito

Research Area: Electronics Integrated Circuit Design

Basic Research: Brain interfaces, thermoacoustic imaging for therapy & diagnostics, radiation damage, electronics for ATLAS (CERN), Quantum Computing, Artificial Intelligence, mm-wave device characterization and modeling.

Industrial Research: Circuits for automotive (power management and communication on the power supply line), for audio microphones (MEMS), for high voltage (600V), for sensor interfaces, RF/microwave circuit design for wireless communications and space applications.

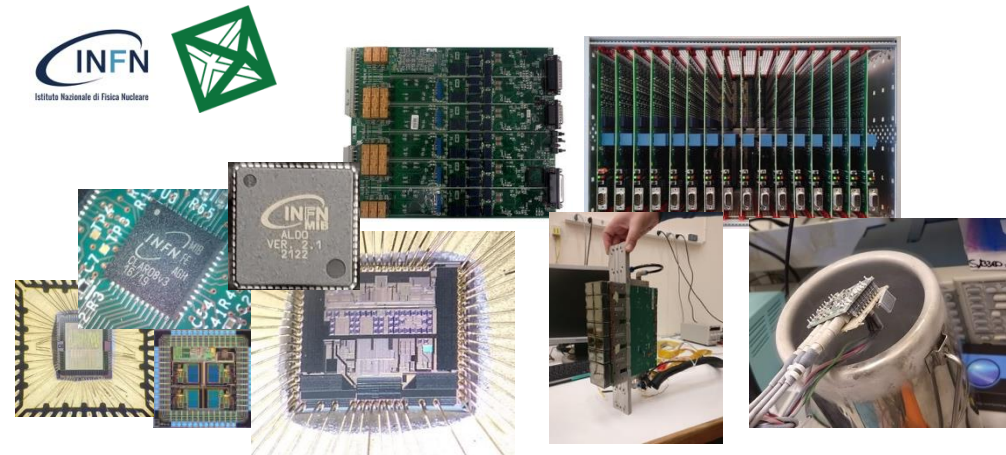


Electronics for Physics

The group also works with the Istituto Nazionale di Fisica Nucleare (INFN).

Paolo Carniti, Claudio Gotti, Gianluigi Pessina

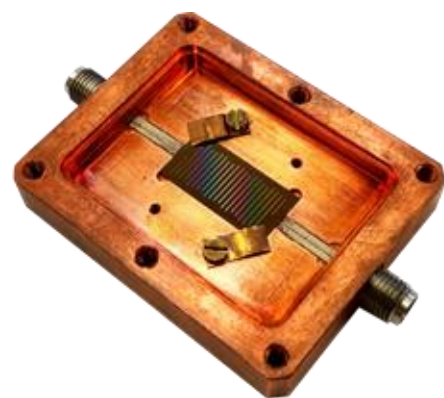
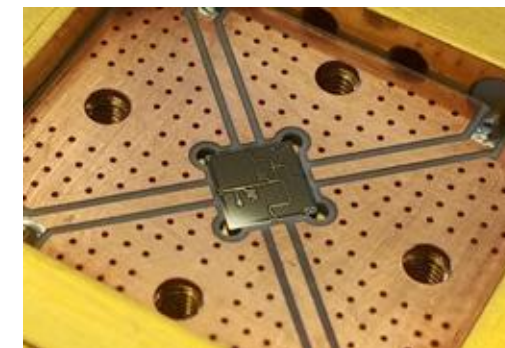
- Circuit design for detector readout in physics experiments
- Analog electronics (low noise, wide bandwidth, ...)
- Digital electronics (microcontrollers, FPGAs, ...)
- Electronics for extreme environments
 - Cryogenic temperatures
 - Radiation-resistant electronics



Quantum Science and Technology

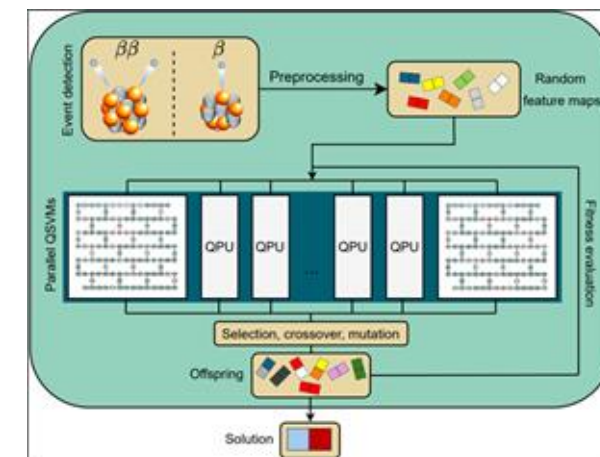


Design, simulation, characterization, and readout of superconducting qubits for **quantum sensing in light dark matter** searches and quantum computation for applications in theoretical and high-energy physics (QUART&T experiment).



Design, simulation, and characterization of superconducting parametric amplifiers in the quantum regime to enhance quantum sensing through vacuum squeezing and advanced readout techniques (MiSS project).

Development of advanced quantum algorithms for simulations and classification using quantum machine learning and quantum-hybrid approaches for fundamental physics applications;



Andrea Giachero, Angelo Nucciotti, Marco Faverzani

Applied Physics

Medical Physics Applied to Diagnostics and Therapy

- *Bravin, Castiglioni, Nucciotti, Paganoni, Pizzichemi, ...*
 - *San Gerardo, Niguarda, IEO, CNAO, European Synchrotron Radiation Facility, ...*



Environmental Physics

- *Capelli, Clemenza, Di Stefano, Paganoni, Sisti, ...*
 - *Dep. of Earth and Environmental Sciences, INFN, Else Nuclear, ...*

Physics Applied to Cultural Heritage

- *Cataldo, Clemenza, Di Martino, Marcucci, ...*
 - *Sassari University, INFN, ISIS, museums, ...*



Nuclear Reactors and Neutron Fluxes

- *Chiesa, Clemenza, Nastasi, Sisti, ...*
 - *LENA Pavia, ISIS Neutron and Muon Source (UK), ...*

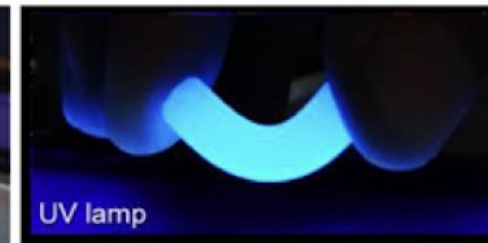
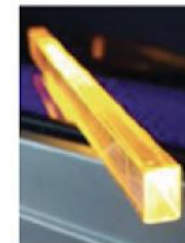


Development of new Radiation Detectors

- *Capelli, Croci, Gironi, Nastasi, ...*
 - *INFN, Dep. of Material Science, Else Nuclear, ...*

Trace Element Analysis

- *Chiesa, Clemenza, Nastasi, Sisti, ...*
 - *INFN*



Admission to the Master Program in Physics

No set enrollment limit – Open access with an interview

Applicants must possess a first-level, three-year (Bachelor's) university degree or a recognized equivalent qualification from a non-Italian Institution.

For candidates holding an Italian **Bachelor's degree in Physics** the curricular requirements are automatically met.

If final grade of **90/110 or higher** candidates are exempt from the interview.

Students from other degree classes must have at least **18 ECTS** in the scientific-disciplinary areas MAT/01-MAT/09 and at least **24 ECTS** in the scientific-disciplinary areas FIS/01-FIS/08.

Assessment interview: The Commission will check the knowledge required and suggest a suitable path for students to pursue their studies with success. If the candidate's curriculum does not show adequate preparation in **Quantum Mechanics**, this will be verified in the interview.

<https://elearning.unimib.it/course/view.php?id=22536>

Language requirements: B2 English certification.

Students with international qualifications

Starting from 2025-26 intake, candidates with international qualifications will benefit from [a new application platform](https://apply.unimib.it): <https://apply.unimib.it>

Additionally, VISA- SEEKER candidates will have the advantage of an earlier evaluation, granting them extra time to complete the necessary procedures related to the issuance of the study visa.

The platform is **exclusively for students (both Italian and international) holding a foreign qualification**. Please consult [Apply@Unimib website](#)

Single courses

It is possible to enrol in single courses activated at the University (maximum 24 ects).
<https://en.unimib.it/services/offices-and-facilities/student-services/single-courses>.

Part-time enrolment

Possibility of part-time enrolment according to the procedures defined in Article 12 of the Student Regulations of the University of Milano – Bicocca.

https://www.unimib.it/sites/default/files/2023-11/reg-stud_Versione%20sito.pdf

This is intended to ensure that students who cannot attend continuously have the opportunity to extend their study program for a number of years equal to twice the normal duration of the degree program.

->> This option has many constraints, assess if it is worthwhile for you.

Organizational Chart of the Master Degree Program

President of the Teaching Board of Bachelor and Master Degree Courses: **Prof. Alessio Ghezzi**

Supervisor of the Master program: **Prof. Sara Pasquetti**

Program coordinators:

Biophysics- Prof. Maddalena Collini

Electronics - Prof. Andrea Baschirotto

Applied Physics- Dott. Luca Gironi

Particle Physics- Prof. Maurizio Martinelli

Plasma Physics- Prof. Claudia Riccardi

Solid State Physics- Prof. Marco Bernasconi

Theoretical Physics- Prof. Mattia Bruno

Teaching Secretariat: Dott. Mara Perrone

+39 02 6448 4080

e-mail didattica.fisica@unimib.it

Web: <https://elearning.unimib.it/course/index.php?categoryid=3507>

Study Plan

The study plan is the set of compulsory training activities, activities planned as optional and training activities chosen independently by the student in accordance with the Regulation and the Teaching Rules of the course.

It is possible to submit an individual study plan that also includes training activities other than those provided for in the Teaching Regulations, provided that it is consistent with the Teaching Order of the course of studies of the academic year of registration.

The student is assigned a study plan at the time of enrollment in the first year, which constitutes the statutory study plan. The student must then submit his or her study plan which indicates the activities he or she may choose.

The study plan is approved by the Educational Coordination Council. The University defines the terms and deadlines for submitting the plan. The student's right to take a test for an activity is conditional on the activity being included in the last approved study plan.

For anything not included here, please refer to the University Regulations for students.

Study plans are approved by the respective committee.

For specific advice on which exams to include refer to the PROGRAM COORDINATORS.

Master in Physics: 2 years, 120 CFU

Curriculum A – Theoretical Physics

Curriculum B – Particle Physics and Applied Physics

Curriculum C – Physics of Matter

General structure of the Three Curricula:

First Year – 58 CFU:

- **Core Courses:** 40 CFU
- **Related and Complementary Courses:** 18 CFU

(Core and Related Courses for curricula A, B, and C are listed below. (*) are in Italian)

Second Year – 62 CFU:

- **Elective Courses:** 12 CFU
- **Further Training Activities** 3 CFU
- **Final Thesis Preparation:** 47 CFU

Curriculum A: Theoretical Physics. 40 CFU from this list of Core Courses:

Theoretical and Fundamental Physics Area – 24 CFU (Compulsory Courses):

- General Relativity (FIS/02) – 6 CFU
- Quantum Field Theory I (FIS/02) – 6 CFU
- Theoretical Physics I (FIS/02) – 6 CFU
- Theoretical Physics II (FIS/02) – 6 CFU

Microphysics and Matter Structure Area – 6 CFU (Compulsory Course):

- Quantum Field Theory II (FIS/04) – 6 CFU

Experimental and Applied Area – 10 CFU (Choose One Course):

- Laboratory of Theoretical Computational Physics (FIS/01) – 10 CFU
- Laboratory of Biophotonics I (FIS/07) – 10 CFU
- Laboratory of Nuclear and Subnuclear Measurements I (FIS/01) – 10 CFU
- Laboratory of Plasma Physics I (FIS/01) – 10 CFU
- Laboratory of Quantum Technologies, Materials, and Sensors I (FIS/01) – 10 CFU

Curriculum A: Theoretical Physcis. 18 CFU from this list of related and complementary courses:

- Computational Material Science (FIS/03) – 6 CFU**
- Experimental Methods in High Energy Physics (FIS/04) – 6 CFU**
- Geometric Methods for Theoretical Physics (MAT/03) – 6 CFU**
- Introduction to Cosmology (FIS/05) – 6 CFU**
- Machine Learning Applications (FIS/07) – 6 CFU**
- Mathematical Methods for Physics (FIS/02) – 6 CFU**
- Particle Physics II (FIS/01) – 6 CFU**
- Particle Physics III (FIS/01) – 6 CFU**
- Quantum Gravity (FIS/02) – 6 CFU**
- Quantum Information and Quantum Computing (FIS/02) – 6 CFU**
- Quantum Materials (FIS/03) – 6 CFU**
- Statistical Mechanics (FIS/02) – 6 CFU**
- Statistics and Data Analysis (FIS/01) – 6 CFU**
- Theory and Phenomenology of Fundamental Interactions (FIS/02) – 6 CFU**
- Theory of Condensed Matter (FIS/02) – 6 CFU**

Curriculum B: Particle Physics and Applied Physics.
40 CFU from this list of Core Courses, part I

Experimental and Applied Area – 22 CFU

Consisting of:

• **16 CFU** chosen from the following course pairs:

- **Laboratory of Nuclear and Subnuclear Measurements I (FIS/01) – 10 CFU**
& **Laboratory of Nuclear and Subnuclear Measurements II (FIS/01) – 6 CFU**
- **Laboratory of Biophotonics I (FIS/07) – 10 CFU**
& **Laboratory of Biophotonics II (FIS/07) – 6 CFU**
- **Laboratory of Quantum Technologies, Materials, and Sensors I (FIS/01) – 10 CFU**
& **Laboratory of Quantum Technologies, Materials, and Sensors II (FIS/01) – 6 CFU**

• **6 CFU** chosen from:

- **Applications of Physics to Medicine – Medical Physics (FIS/07) – 6 CFU**
- **Biophotonics (FIS/07) – 6 CFU**
- **Particle Physics II (FIS/01) – 6 CFU**
- **(* Sustainable Energy (FIS/07) – 6 CFU**

Curriculum B: Particle Physics and Applied Physics.
40 CFU from this list of Core Courses, part II

Theoretical and Fundamental Physics Area – 6 CFU

Choose one of the following courses:

- **Statistical Mechanics** (FIS/02) – 6 CFU
- **Theoretical Physics I** (FIS/02) – 6 CFU
- **Theory of Condensed Matter** (FIS/02) – 6 CFU

Microphysics and Matter Structure Area – 12 CFU

Choose two of the following courses:

- **Applied Quantum Technologies** (FIS/04) – 6 CFU
- **Energy Physics** (FIS/03) – 6 CFU
- **Optical Microscopy** (FIS/03) – 6 CFU
- **Particle Physics I** (FIS/04) – 6 CFU
- (*) **Radiation Detectors** (FIS/04) – 6 CFU
- **Solid State Physics** (FIS/03) – 6 CFU

Curriculum B: Particle Physics and Applied Physics 18 CFU from this list of related and complementary courses:

- Application of Neutron Physics, FIS/07 - 6 CFU
- Applied Electronics, ING-INF/01 - 6 CFU
- Computational Material Science, FIS/03 - 6 CFU
- Experimental Methods in High Energy Physics, FIS/04 - 6 CFU
- General Relativity, FIS/02 - 6 CFU
- Machine Learning and Statistical Physics of Macromolecular Systems, FIS/07 – 6 CFU
- Machine Learning Applications, FIS/07 - 6 CFU
- Mathematical Methods for Physics, FIS/02 - 6 CFU
- Monte Carlo Simulation of Radiation Detectors, FIS/04 - 6 CFU
- (*) Nanobiotechnologie, BIO/10 – 6 CFU
- Optical Spectroscopy of solids, FIS/03 - 6 CFU
- Particle Physics III, FIS/01 - 6 CFU
- (*) Processi a Basso Impatto Ambientale, CHIM/06 - 6 CFU
- Quantum Information and Quantum Computing, FIS/02 - 6 CFU
- Quantum Materials, FIS/03 - 6 CFU
- Quantum Photonics, FIS/03 – 6 CFU
- (*) Radiazioni elettromagnetiche non ionizzanti, FIS/01 - 6 CFU
- (*) Radioattività, FIS/04 - 6 CFU
- Statistics and data analysis, FIS/01 - 6 CFU
- Theoretical physics II, FIS/02 - 6 CFU
- Theory and Phenomenology of Fundamental Interactions, FIS/02 - 6 CFU

Curriculum C: Physics of Matter. 40 CFU from this list of Core Courses:

Experimental Application Area, 16 CFU to be chosen from the following pairs of courses:

- (*) Electronics Laboratory I, FIS/01 - 10 CFU and
- (*) Electronics Laboratory II, FIS/01 - 6 CFU
- Laboratory of Plasma Physics I, FIS/01 - 10 CFU and
- Laboratory of Plasma Physics II, FIS/01 - 6 CFU
- Laboratory of Quantum Technologies, Materials, and Sensors I, FIS/01 - 10 CFU and
- Laboratory of Quantum Technologies, Materials, and Sensors II, FIS/01 - 6 CFU

Theoretical and Fundamental Physics Area, 6 CFU to be chosen from the following courses:

- Statistical Mechanics, FIS/02 - 6 CFU
- Theoretical Physics I, FIS/02 - 6 CFU
- Theory of Condensed Matter, FIS/02 - 6 CFU

Microphysics and Structure of Matter Area, 18 CFU to be chosen from the following courses:

- Applied Quantum Technologies, FIS/04 – 6 CFU
- Energy Physics, FIS/03 - 6 CFU
- Optical Spectroscopy of Solids, FIS/03 - 6 CFU
- Physics of Semiconductors, FIS/03 - 6 CFU
- Plasma Physics I, FIS/03 - 6 CFU
- Plasma Physics II, FIS/03 - 6 CFU
- Solid State Physics, FIS/03 - 6 CFU

Curriculum C: Physics of Matter. 18 CFU from this list of related and complementary courses:

18 CFU to be chosen from the following courses:

- Application of Neutron Physics, FIS/07 - 6 CFU
- Applied Electronics, ING-INF/01 - 6 CFU
- Computational Material Science, FIS/03 - 6 CFU
- Experimental Methods in High Energy Physics, FIS/04 - 6 CFU
- Fabrication and Characterization of Nano and Quantum Materials, FIS/03 – 6 CFU
- (*) Industrial Informatics, ING-INF/05 – CFU
- Machine Learning and Statistical Physics of Macromolecular Systems, FIS/07 – 6 CFU
- Machine Learning Applications, FIS/07 - 6 CFU
- Mathematical Methods for Physics, FIS/02 - 6 CFU
- Monte Carlo Simulation of Radiation Detectors, FIS/04 - 6 CFU
- Quantum Electronics, ING-IND/22 – 6 CFU
- Quantum Information and Quantum Computing, FIS/02 - 6 CFU
- Quantum Materials, FIS/03 - 6 CFU
- Quantum Photonics, FIS/03 – 6 CFU
- (*) Non-Ionizing Electromagnetic Radiation, FIS/01 - 6 CFU
- (*) Radiation Detectors, FIS/04 - 6 CFU
- (*) Energy Sustainability, FIS/07 - 6 CFU
- Statistics and Data Analysis, FIS/01 - 6 CFU