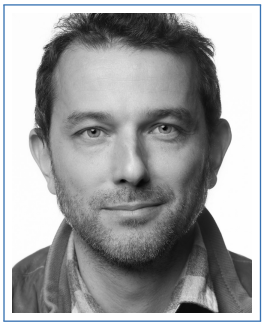
Dr. Domenico Franco

Physicist Researcher



General information

Place of birth: Rome

Citizenship: Italian

Current Position: Associate Researcher Scientist at Yale University

Professional address: 272 Whitney Ave, New Haven, CT 06511 (USA)

☎: +1 2034324623

✉: d.franco@protonmail.com

Education

2004 - 2007: **Ph.D in Nuclear and Particle Physics**, *University of Rome "Tor Vergata"*, Rome.

2000 - 2004: **Physics Degree**, *University of Rome "Tor Vergata"*, Rome, *Note: 110/110.*.

Professional Record

2017 - Today **Associate Researcher Scientist**, *Yale University*, New Haven - CT, USA.

2014 - 2016 **Postdoctoral researcher**, *University of Zürich*, Zürich, Switzerland.

2012 - 2014 **Senior Postdoctoral researcher**, *University of Lyon "Claude Bernard"*, Lyon, France.

2009 - 2012 **Postdoctoral researcher**, *University of Bern*, Bern, Switzerland.

2007 - 2008 **Research grant**, *University of Rome "Tor Vergata"*, Rome, Italy.

2004 - 2007 **PhD fellowship**, *University of Rome "Tor Vergata"*, Rome, Italy.

Fields of interest

High energy particle and nuclear physics. Neutrino and dark matter physic. Particle detectors R&D, rare events detection. Astrophysics and neutron physics. Photoreactions on light nuclei and meson photoproduction. Biophysics, Medical and applied physics.
Finance with special interest in market behavior analysis and optimization of investment strategies. Macro and micro-economy.

Experience

Specific competences

- Development of particles, charge and light detectors.
- Development of data analysis and simulation packages.
- Development of DAQ software.
- Development of Slow Control software.
- Cryogenics, ultra-high vacuum and high voltage techniques.
- Use of noble liquids and gas.
- Electronics.
- Use of Laser.
- Use of mechanical workshop machines.

Computer skill

Operative systems:	UNIX, Linux, Windows, Macintosh.
Languages:	Python, Visual Basic, FORTRAN, C, C++, MySQL.
CAD software:	Solid Works, CATIA, FreeCAD, Inventor, VARICAD.
PCB design software:	EAGLES.
Data acquisition and monitoring:	Labview
Data analysis:	ROOT, PAW, R.
Other packages:	OFFICE: Word, Power Point, Excel, Access.

Languages

Italian	Mother language
English	C2
German	A2
French	A2
Spanish	B1

Teaching duties

- Assistant for the Experimental Astroparticle class at Zürich University.
- Assistant for the Laboratory of physics class at Zürich University.
- Assistant for the Advanced Laboratory of physics class at Zürich University.
- Assistant for the electron spin resonance activity of the Laboratory Course at Bern University.
- Assistant for the General Physics for Biology class at University of Rome "Tor Vergata".
- Member of different examining boards for General Physics, Electromagnetism, Nuclear and Particle Physics.
- Supervisor of master and PhD. students.

Hobbies

Sport:	Karate, Volleyball (both as player and coach).
Cultural:	Guitar, theater (as a actor), books.

Summary of the research activities

2017 - Today (Yale University, MicroBooNE, DUNE, SBND collaboration)

- Production Manager for the Anode Plane Assembly Factory at Yale's Wright Laboratory in the framework of the DUNE experiment.
- Local coordinator for the DUNE project.
- Local coordinator for the SBND experiment.
- Supervisor for production, quality control, assembly and installation of the SBND Field Cage in the SBND Detector.
- Supervisor for production, quality control, testing and installation of the SBND Field Cage voltage dividers.
- Design and construction of the Cathode-to-Field Cage connection high voltage electric board.
- Design and construction of a Liquid Argon TPC system (field cage, purification system, electronic chain) for local test and experiments at Yale University.

2014 - 2016 (Zurich University, XENON Collaboration)

- Design, construction and installation of the XENON1Ton feedthroughs chamber.
- Development of a low noise amplifier for the Hamamatsu R11410-20 PMT for the XENONnT detector.
- Design and implementation of 16 channel NIM module low noise amplifier.
- Design of the new Hamamatsu R11410-20 PMT cryostat set-up at UZH.
- Supervisor of the Hamamatsu R11410-20 Xenon1TON PMT bases design and production.
- ^{83m}Kr analysis for the calibration of the XENON100 detector.
- Hamamatsu R11410-20 photomultiplier's test at University of Zurich.
- Supervisor of the XENON1Ton potted feedthrough production and installation.

2012 - 2014 (Lyon University, LABEX-LYO, LBNO Collaboration)

- Conceptual design and construction of the liquid argon (LAr) TPC for the cryogenic amplifiers test.
- Design and construction of 30 kV high voltage feedthrough.
- Design of the liquid argon inlet feedthrough.
- Design and implementation of the slow control for the LAr TPC.
- Conceptual design and construction of an apparatus for the Paschen law's measurement.
- Cryogenic systems monitoring and control (GRAAL Experiment, EXO collaboration).
- Conceptual design of high precision LAr lever meters.
- Design of the printed circuit board for internal connections of LAr lever meters.
- Design of the printed circuit board for the LAr lever meters readout.

2009 - 2012 (Bern University, EXO Collaboration)

- Measurements of the $2\nu\beta\beta$ half-life of the ^{136}Xe with the EXO-200 detector.
- Measurements of the limit on the $0\nu\beta\beta$ half-life of the ^{136}Xe with the EXO-200 detector.
- R&D of a high pressure gas Time Projection Chamber (TPC) for the EXO experiment.
- UV-light detection with wavelength shifter doped scintillators and solid state photomultipliers.
- Design and construction of a prototype UV-light detector.
- Conceptual design and construction of a xenon gas TPC with integrated UV-light detector.
- Conceptual design of the UV-light detector front-end electronics.
- Study of the response of Micromegas charge readout detector in high pressure gas environment.
- Measurements of Argon and Xenon muons ionization tracks in the high pressure TPC up to 5 bars.
- R&D on the cryogenic charge readout for large size liquid argon TPCs.

2003 - 2009 (Rome-2 University, GRAAL Collaboration)

- Production of high energy γ-rays beams with the Compton Back-scattering technique in the framework of the GRAAL experiment.
- Study of photoreactions on Hydrogen and Deuterium liquid target.
- Measurements of the deuteron photodisintegration Σ beam asymmetry in the range of γ energy of 600-1500 MeV.
- Measurements of polarization observables in different reactions of mesons photoproduction.
- Measurements of the limits on light-speed anisotropies from Compton scattering of high-energy electrons.
- Calibration and maintenance of the BGO calorimeter and of dE/dx plastic barrel detector.
- Production and maintenance of liquid cryogenic H_2 and D_2 targets.