Curriculum Vitae

- December 1982 "Laurea in Fisica" (University of Bari) (Advisor G. Preparata)
- December 1982 - December 1983 military service
- 1984-1986 PHD student in Physics - University of Bari
- June 1987 PhD in Physics (Advisor G. Preparata)
- April 1987 - May 1988 Postdoc Fellow INFN Sezione di Bari
- 1988 - 2008 Researcher INFN Sezione di Bari
- Since 2008 Senior Researcher INFN Sezione di Bari
- National Scientific Qualification (ASN "Abilitazione Scientifica Nazionale") as Full Professor in Theoretical Physics of Fundamental Interactions (FIS/02) in Italian universities
- 2004 – 2010 coordinator of the theoretical physics group INFN Sezione di Bari
- Since 2017 coordinator of the INFN scientific project NPQCD (Non Perturbative QCD)
- Author of 97 scientific publications on international journals
- Speaker in 35 International Conferences
- Organizer of 14 International Conferences
- Co-Editor of the "Lattice 1999" Conference Proceedings
- Co-Editor of the "EPIC@LHC" Conference Proceedings
- Co-Editor of the "SQM 2019" Conference Proceedings

The scientific activity started in 1983 and its main theme has been the study of the Theoretical Elementary Particle Physics and Quantum Field Theory, with a particular emphasis on the study of color confinement and the phase diagram in Quantum Chromo Dynamics (QCD) by means of lattice non perturbative methods. Other fields of research have been the study of triviality in 4-dimensional scalar self-interacting theory, the investigation of cosmic acceleration of the universe, the application of quantum computing techniques to the investigation of the thermodynamical properties of simple systems.

The main scientific results are the following:

- Lattice non perturbative investigations on the QCD phase diagram at finite temperature and density by means of analytic continuation and determination of the curvature of the pseudocritical line in the QCD phase diagram with (2+1) flavors.
- QCD vacuum dynamics in presence of background fields: first studies by using the method of the external current; introduction of a lattice gauge-invariant effective action for external background fields; numerical evidence of the unstable modes in the QCD vacuum; dependence of the deconfinement temperature on the strength of a chromomagnetic

background field and possible implications on the nature of the color confinement; study of the order of the QCD phase transition by means of the lattice background field effective action.

- Flux tubes in the QCD vacuum and their relevance for the dynamics of deconfinement phase transition: measurement on the lattice of the chromo-electromagnetic fields produced by a static quark-antiquark pair at zero temperature and across deconfinement transition. Indication of a procedure to extract the confining part of the quark-antiquark potential.
- Analysis of the rescaling of the scalar condensate in 4d Ising model.