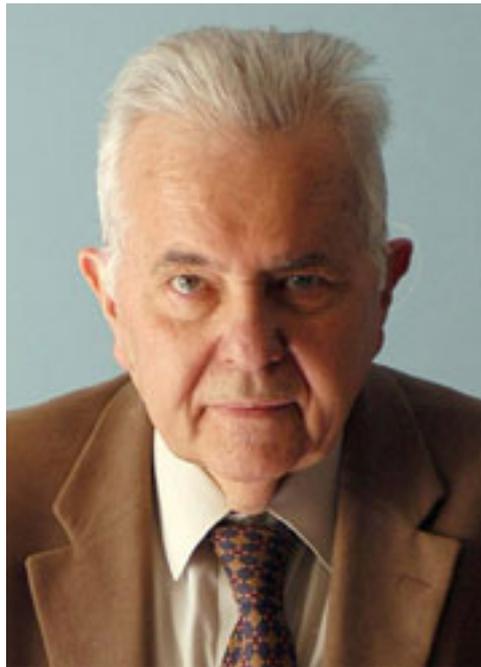




## Prof. Nicola Cabibbo

Professor of Theoretical Physics at the University of Rome  
'La Sapienza'



### **Most important awards, prizes and academies**

*Awards:* Premio Alcide De Gasperi per le Scienze (1968); J.J. Sakurai Prize for Theoretical Particle Physics of the American Physical Society (1989); High Energy and Particle Physics Prize of the European Physical Society (1991). *Academies:* Socio Nazionale dell'Accademia Nazionale dei Lincei, Rome; Socio Nazionale dell'Accademia delle Scienze, Turin; Foreign Member of the National Academy of Sciences, USA; Foreign Member of the American Academy of Arts and Sciences; Member of the Pontifical Academy of Sciences. Loeb Lecturer, Harvard University (1965).

### **Summary of scientific research**

Nicola Cabibbo was a theoretical physicist who worked on different aspects of elementary particles and their interactions. He made important contributions to the theory of weak interactions, in particular through the discovery of the phenomenon of quark and current mixing. This discovery established the existence of a new class of physical constants, whose first example is the Cabibbo angle which determines the mixing of strange quarks with non-strange quarks. At the same time this discovery clarified the behaviour of weak interactions for different quark species, thus creating

the basis for the development of unified theories of weak and electromagnetic interactions. N. Cabibbo carried out (in collaboration with R. Gatto) the first theoretical studies on the use of electron positron colliding beam machines, demonstrating their great promise for revealing new aspects of elementary particle structure. An important contribution to the theory of strong interaction was the demonstration that the extended nature of hadrons as quark composites implies the existence of a new phase of hadronic matter (obtained at high temperature or high density) where quarks are deconfined. An experimental signature for the existence of this phase is given by the exponential nature of the hadron spectrum. In his final years N. Cabibbo's scientific activity had been centered on the use of large computers for the numerical simulation of quark interactions. He established the methods for applying numerical simulation to the study of weak interaction of quarks. In the same period he became interested in computer architecture and was engaged in building a Supercomputer (APE) particularly adapted to the problems of numerical simulation.

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### Main publications

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Ferbel, ed.), NATO ASI Series, Series B: Physics, vol. 99 (47) Plenum Press (1983), New York, *Proceedings of the Second NATO Advanced Study Institute*, Lake George (July 1982); Allega, M., Cabibbo, N., 'Acoustic Detection of Superheavy Monopoles in Gravitational Antennas', *Lett. Nuovo Cimento*, 38, pp. 263-9 (1983); Cabibbo, N., Martinelli, G. and Petronzio, R., 'Weak Interactions on the Lattice', *Nuclear Physics*, 244B, pp. 381-91 (1984); Cabibbo, N., 'Quark Mixing', *Proceedings of the X Capri Symposium, 30 Years of Elementary Particle Theory* (May 1992).