Curriculum vitae

PERSONAL INFORMATION

First and Family name: Luigi Cimmino

Born: Naples (Italy), 26/10/1977

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EDUCATION

September 2010-March 2011: Term contract with Osservatorio Vesuviano of INGV

April 2010-July 2010: Scholarship with University of Naples "Federico II" Department of Physics and INFN section of Naples.

July 2009: M. S. degree in Physics, 103/110
Title of thesis: *Finite levels quantum mechanical model for Quantum Oracle*

RESEARCH ACTIVITIES

Term contract with Osservatorio Vesuviano of INGV (6 month):

I dealt with the optimization and construction of the first Mu-Ray telescope. Several tests and, consequently, improvements were made to strengthen the modules and to improve them assembly, bounding fibers to the optical connectors and studying different type of protection to the fibers'spatter. The software MuBot, previously made to monitor telescopes, has been provided of a user-friendly graphic interface and upgraded to the second version.

Scholarship with University of Naples "Federico II" (4 month):

I attended in the Mu-Ray collaboration for the muon radiography of the summit cone of Mt. Vesuvius and for future application to other volcanoes. Muon radiography is based on the observation of the absorption of muons in matter, as the common radiography uses X-rays. The interaction of cosmic rays with the atmosphere provides a plentiful source of muons, which can be used to study the inner structure of the volcanoes. The Mu-Ray project concerns the possibility to apply muon radiography to study high risk volcanoes, among which Mt. Vesuvius, and to develop instruments and methods suitable for further utilizations. In particular, I worked to study and optimize the optical coupling between WLS fibers and plastic scintillators, one of most tricky operation in the prototype of the Mu-Ray Telescope. During the construction of the module zero of the telescope, I was employed in the development of the assembly techniques for the telescope and in the planning and making of the SiPM's test-board. Moreover, I worked on an old muon telescope to characterize the photomultipliers in it, to maintain the apparatus and to develop with the Python programming language the real-time monitoring system MuBot, suitable for the muon telescopes.

M.S. degree Thesis:

My thesis was focused on the Quantum Teleportation applied to Quantum Computation implementing alternative quantum measurements. The work shows a brand-new way of making deterministic Quantum Computing (short QC), in the sense of Theory of Calculability, by meaning of unitary evolution. Starting from the original Shor's Algorithm, I explain how the newest one works, at least compared to theory, reaching a new conceptual foundation of QC and resulting from a set of conventional and well known results of Calcolability and Quantum Mechanics. In the practice, an inaccessible relativized process let us able to obtain same results with the same outlay in the time resource as the Shor's one for factorizing a given number n. Then this quantum system represents a way to the relativized calculus to put in to practice an oracle, kind of object having till now abstract nature. The basic physical tool of our theorization, we call Quantum State Selection, consists in the twin-combined measurement process through positive valued measure operator (POVM)[Per02], needed to provide the Q-oracle's answer.

CONFERENCES AND TALKS

International Workshop on Muon Radiography of Volcanoes,

(**Organising Committee**) *Naples 11-12 October 2010*, title: The coupling of the optical WLS fibres to the scintillators.

LIST OF PUBLICTIONS

1.
L'Irrisolta Tensione della Didattica ed i Fondamenti della Fisica
LFNS 3/2005, Atti dei XLII e XLIII Congresso Nazionale AIF 2003-2004
(2004)

2.
Algebraic Relations for Recursive Sequences
arXiv : math/0510417
(2005)

3.
Shor's Algorithm in the Mindset of Quantum Oracles
arXiv : 0910.0287
(2009)

PROGRAMMING and COMPUTING

- C\C++, PYTHON, PERL, ASSEMBLY, MYSQL, PHP, HTML, AJAX, SHELL, ROOT
- WINDOWS, LINUX
- OFFICE: EXCEL, WORD, POWERPOINT, ACCESS

LANGUAGES

- ITALIAN (NATIVE SPEAKER)
- ENGLISH