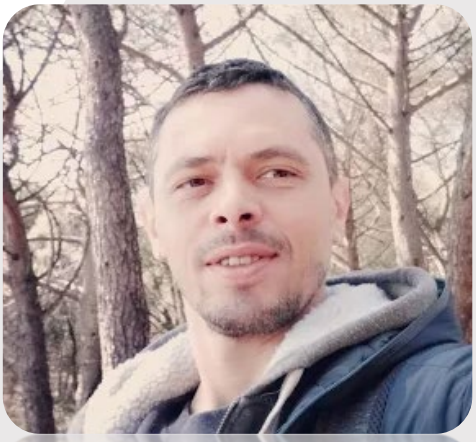

DR. LUIGI CIMMINO, UNIVERSITY OF NAPLES "FEDERICO II", ITALY

During his research career, Luigi has been involved in various fields of Physics: Quantum Physics, Detectors for Particle Physics, and Muon Radiography. In each of these areas he participated with a great collaborative spirit, creativity in proposing new ideas, and overall problem solving skills. He has held positions of responsibility and directed groups of researchers.

For more than ten years he has been active on the most disparate aspects of muon radiographic imaging methodology, studying new techniques, designing and manufacturing detectors, and he has participated in various measurement campaigns that have allowed to better understand the technique, providing robust experimental proofs of the Muon Radiography methodology.

CONTACTS

PHONE:
+39 081 676 366

WEB SITE:
www.docenti.unina.it/luigi.cimmino

E-MAIL:
luigi.cimmino@unina.it
cimmino@na.infn.it

LECTURES ON MUOGRAPHY

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A little bit of Physics
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Muographic Methodologies
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Detectors for Muography and Applications
Case Studies – Emulsions – Gaseous RPC Detectors – Scintillators based Detectors – Background

The MURAVES Experiment
Detector – Technologies – Background Rejection

Measurement of the Time-of-Flight
General – The Time Expansion TDC – Offline Calibration (Samip Basnet)

PART II (2021, 24RD SEP)

Computerized Techniques
Tools for Simulations (Marwa Al Moussawi) – Technique for 3D Reconstruction from Multiple Muographies

Future Developments
SAMURAI Project – Differentiable Programming for Muography Detectors Optimization

OBJECTIVES

The Lectures are mainly aimed at PhD students who are involved in Muography activies, both hardware (detector and electronics design) and software (simulations, analysis). PhD students from other areas, postdoc staff and researchers are warmly encouraged to attend the lectures in order to understand the very basics, the state of art and the future perspectives of this innovative field of Applied Physics.

Course participants will understand the methodology starting from the formation of muons in the upper atmosphere to their detection with detectors, that have been built over the last 15 years to look through massive geological structures or to reveal density inhomogeneities in human-made artifacts.