



H2020 Grant Agreement N° 690835

Deliverable D7.4 – WP7 – Due date: 30 September 2016

Title: First MUSE General Meeting

Type: Other

Dissemination level: public

WP number: WP7

Lead Beneficiary: INFN

Description:

The 2016 MUSE General Meeting was held in Pisa, on 28-30 September 2016. More than 30 researchers from different institutions attended the meeting. The complete timetable of the meeting, with slides of presentations, is available at the following address: <http://agenda.infn.it/event/muse2016>

The first two days were devoted to the review of the activities connected to the project. Some specific talks of general interest were also included in the agenda.

During the General Meeting, a joint meeting of the Management Board and Scientific Board took place, mainly focused on an in-depth discussion on the running of the first months of the project.

The last day of the meeting was dedicated to training and outreach activities. Several seminars were organized during the training session of the MUSE researchers:

1. M. Razzano (University of Pisa), "Writing for general public"

Abstract - Communicating science is becoming more and more important for scientists. Our audience could be the general public, students, school teachers, politicians and various kind of stakeholders. In order to properly communicating our science results, it is important to gain some basic knowledge of our audience and of some basic communication tools. We'll discuss some useful aspects to keep in mind when communicating science.

2. C. Sotiropoulou (University of Pisa and INFN Pisa), "Medical imaging processing using brain emulator"

Abstract - We propose the use of an algorithm based on the learning process of the human vision as an edge-enhancing filter for medical images. We set up an experiment to test its impact on the performance of decision-making algorithm working on brain magnetic resonance data. The execution times of similar filters can become unpractical on real 3D or higher dimensional data, if implemented on CPU. We developed an innovative and high performance embedded system for real-time pattern matching. The design uses Field Programmable Gate

Arrays (FPGAs) and the powerful Associative Memory chip (an ASIC) to achieve real-time performance. The implementation of this edge-enhancing filter on FPGAs and Associative Memories is expected to positively impact on medical devices for real-time diagnosis (e.g. diagnostic ultrasound) and for image processing steps in medical image analysis where computing power is a limiting factor.

3. M. Morrocchi (University of Pisa), “Application of SiPMs in Positron Emission Tomography”

Abstract - Silicon photomultipliers (arrays of avalanche photodiodes working in Geiger-Muller regime) are extensively used in biomedical imaging, in particular for positron emission tomography (PET, an imaging modality that uses short-lived positron emitters for functional studies). The interest in these photodetectors comes from several advantages: the compactness, low power consumption compared to photomultiplier tubes, the insensitivity to magnetic fields. The possible applications of SiPMs in PET and the activity in which the group of Pisa is involved will be shown.

4. V. Giusti (University of Pisa), “Reactor Physics Group Activities”

Abstract – We present an overview of the research activities carried on by the Reactor Physics Group of the Engineering Civil and Industrial Department, Pisa University. Development of computational code for neutron transport and application of neutrons in medicine will be discussed.

The outreach session of the General Meeting was organized during the 2016 edition of the “European Researchers’ Night”. The target audience had been University students, with two seminars on the experiments of the Muon Campus:

1. D. Glenzinski (Fermilab), “A Rare Opportunity – The Mu2e Experiment at Fermilab”

Abstract - Quarks and neutrinos are known to change flavors, but what about the charged leptons? The proposed Mu2e experiment at Fermilab will offer a sensitivity to charged-lepton flavor violating processes four orders of magnitude better than anything to have come before it. This extraordinary improvement in sensitivity will give Mu2e significant discovery potential over a wide range of new physics models. Moreover, Mu2e probes for this new physics in a manner complementary to the rest of the world's HEP physics program at effective mass scales up to 10,000 TeV. The physics motivations, design sensitivity, and status of the Mu2e experiment will be presented.

2. F. Bedeschi (INFN Pisa), “The Muon $g-2$ Experiment”

Abstract - For many years the last measurement of the muon anomalous magnetic moment at BNL has stirred significant interest in the whole HEP community due to a ~ 3 standard deviation discrepancy between the experimental result and the Standard Model prediction. This new experiment will reduce the experimental resolution by a factor larger than four taking the final accuracy to less than 0.15 part per million. Several major improvements are needed in the generation of clean intense muon beams and the control of several systematic errors. Assuming a realistic improvement in the theoretical accuracy the effect observed at BNL could be boosted up to eight standard deviations with this experiment thus giving a strong evidence for new physics in the TeV scale.

The outreach session was concluded with two talks by two participants of the 2016 edition of the Fermilab Summer Student program, describing their stage experience.



MUSE outreach program for University students



“The High Intensity Frontier at the Fermilab Muon Campus”

30 September 2016

Pisa University, Polo Didattico Fibonacci
Building C – Room 131

Program

- 14:30 D. Glenzinski (Fermilab)
“A Rare Opportunity - the Mu2e experiment at Fermilab”
- 15:30 F. Bedeschi (INFN Pisa)
“The Muon $g-2$ Experiment”
- 16:30 G. Taddei, I. Naranjo De Candido
“Our experience as Fermilab Summer Students”

Courtesy of F. Happacher