LNF GENERAL SEMINARS

LNF Seminars Committee: M. Boscolo (Resp.), T. Spadaro, A. Paoloni, A. Fantoni, S. Bellucci, S. Dell'Agnello, D. Babusci, U. Dosselli, M. Legramante (secr.)

In addition to the general seminars program, we initiated a *LNF mini-workshop series* with the idea of encourage a deeper discussion on a focused topic. In total, seven mini-workshops have been organized covering different research areas, from space physics to high energy physics, as well as applied physics. Typically, they are organized as one-afternoon session workshops.

1 LNF Mini-workshop series list:

Figure 1: *Poster of the 2nd LNF mini-workshop series.*

1. **Geodetic and time measurements for the CNGS (January 26th)**

   (a) Augusto Mazzone (DICEA - Area di Geodesia e Geomatica, Univ. Roma): "CERN-LNGS distance computation for the OPERA project",

   (b) Adrian Jaggi (Astronomical Institute of the University of Bern): "Global Navigation Satellite Systems for Positioning and Time Transfer ",

   (c) Thomas Schildknecht (Astronomical Institute of the University of Bern): "Time Transfer".

2. **Space Exploration (March 8th)** (see poster in Fig. 1)

   (a) Roberto Vittori (ESA-HSO-U and INFN-LNF): "Highlights of Endeavor's final flight and outlook on the Space Shuttle Program"

Figure 2: *Poster of the 3rd LNF mini-workshop series.*

(b) M. Spagnulo (ASI, Office of Presidency):
"ASI Perspectives on space exploration from Long Term Strategic Plan"

(c) David Smith (MIT):
"Highlights of planetary laser ranging and altimetry: Mars (Mars Global Surveyor), Moon (Lunar Reconnaissance Orbiter), Mercury (MESSENGER) and beyond"

3. **Higgs Search at LHC (March 28th)**

Overview:

At present, Higgs search at the LHC is the real hot topic in particle physics. Tremendous effort is being carried on these years to push analyses of LHC data to the sensitivity needed for an unambiguous Higgs identification.The goal of this mini workshop is to give a fresh and deep insight from the people with hands on the matter: those with leading roles in the analyses, who will underline pros and cons of each experimental signature, discuss in depth factors limiting the sensitivity, and present reliable perspectives on future developments, hopefully towards a discovery of uttermost importance. Latest analyses results and hot topics on this interesting issue will be covered (see poster in Fig. 2).

Programme:

(a) Vittorio del Duca (INFN-LNF):
"Introduction"

(b) Stefano Rosati(INFN-RM1):
"Search of the Standard Model Higgs Boson in the $ZZ^* \to 4l$ decay channel at the LHC

(c) Roberto di Nardo (INFN-LNF):
"Search of the Standard Model Higgs Boson in the $H \to WW^* \to l\nu l\nu$ in the decay channel at LHC"

(d) Daniele del Re (Univ. Roma La Sapienza and INFN-RM1):
"Search for a Higgs boson in the $H \to \gamma\gamma$ channel at the LHC"

(e) Simone Gennai (INFN-MIB and CERN):
"Search for a Higgs boson in the $H \to \tau\tau$ in production processes in association with jets at the LHC"

Figure 3: *Poster of the 4th LNF mini-workshop series.*

4. **CNAO Primo Centro Italiano di Adroterapia Oncologica con Ioni (April 12th)**

   Overview:

   Verrà presentato il Centro Nazionale di Adroterapia Oncologica (CNAO) di Pavia, un centro di avanguardia per la cura dei tumori: é, infatti, il secondo in Europa e uno dei pochi al mondo dove saranno eseguiti trattamenti sia con protoni che con ioni carbonio. La struttura é unica in Italia (poster in Fig. 3).

   Programme:

   (a) Sandro Rossi (CNAO, Pavia):
   "Introduzione"

   (b) Claudio Sanelli INFN-LNF):
   "L'INFN e il CNAO"

   (c) Caterina Biscari (INFN-LNF):
   "Commissioning e operazione del CNAO"

   (d) Maria Rosaria Fiore (CNAO, Pavia):
   "Adroterapia: prospettive cliniche"

5. **Monte Carlo Generators at LHC (May 16th)**

   (a) Michael Seymour (University if Manchester) :
   "Monte Carlo event generators for the LHC"

   (b) Biagio di Micco (CERN) :
   "Event generators for the Higgs boson searches at the LHC"

6. **Jet Phenomenology at the LHC (June 27th)**

   (a) Mrinal Dasgupta (University if Manchester):
   "QCD and jet physics"

   (b) Paolo Francavilla (CERN):
   "Jet Physics in ATLAS"

   (c) Paolo Bartalini (National Taiwan University):
   "Underlying event and multiple parton interactions studies at CMS-How soft QCD can prepare the ground for the interpretation of some rare SM backgrounds to searches"

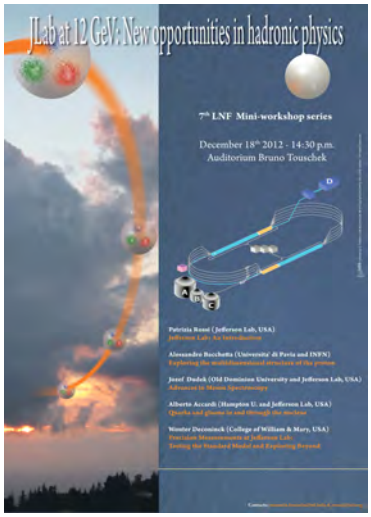

Figure 4: *Poster of the 7th LNF mini-workshop series*

7. **JLab at 12 GeV: New opportunities in hadronic physics (December 18th)**

   Overview:

   Jefferson Lab is a fundamental research laboratory located in Newport News (Virginia-USA). Its primary mission is to explore the fundamental nature of confined states of quarks and gluons, including the nucleons that comprise the mass of the visible universe. It consists of a high-intensity electron accelerator based on continuous wave superconducting radio frequency technology and a sophisticated array of particle detectors. The design features and excellent performance of the accelerator made it possible to plan an upgrade in energy from 6 to 12 GeV without substantially altering the construction scheme of the accelerator. The program includes the construction of major new experimental facilities for the existing three halls, A, B, C and the construction of the new experimental hall D. The project will be completed by the year 2013 and the commissioning of the experimental halls will be extended until the end of 2015. An overview of the 12 GeV experimental program will be presented. It includes: the study of the nucleon "tomography" through the study of generalized parton distribution functions (GPDS) and transverse momentum dependent parton distribution functions (TMDs), the study of exotics and hybrid mesons to explore the nature of the quarks confinement, precision test of the Standard Model through parity-violating electron scattering experiments (see poster in Fig. 4).

Programme:

(a) Patrizia Rossi (Jefferson Lab)"
"Introduction"

(b) Alessandro Bacchetta (Università di Pavia and INFN):
"Exploring the multidimensional structure of the proton"

(c) Josej Dudek (Old Dominion University and Jefferson Lab):
"Advances in Meson Spectroscopy"

(d) Alberto Accardi (Hampton University and Jefferson Lab):
"Quarks and gluons in and through the nucleus"

(e) Wouter Deconinck (College of William and Mary):
"Precision measuremens at Jefferson Lab: Testing the Standard Model and Exploring Beyond"

2 List of the LNF General Seminars in 2012:

1. Paride Paradisi (CERN):
"Direct CP violation in charm and flavor mixing beyond the SM", February 23rd.

2. Barbara Sciascia (LNF):
"First evidence for CP violation in charm decays at LHCb. A short presentation", February 23rd.

3. Nunzio Motta (Queensland University of Technology):
"Conducting polymers and carbon nanostructures for solar energy ", March 1st.

4. Gaia Lanfranchi (INFN-LNF):
"Highlights from Moriond 2012", March 14th.

5. Pierre Bonnal (CERN):
"Planning an accelerator project to ease its follow-up", March 21st.

6. Benoit Daudin (CERN):
"EVM tools at CERN", March 21st.

7. Luisella Lari (CERN) :
"Scheduling the LHC accelerator installation works: an overview of what was done", March 21st.

8. Giacomo Briani (Centre de Spectromtrie Nuclaire et de Spectromtrie de Masse CNRS/IN2P3 - Universit Paris Sud) :
"Ultracarbonaceous antarctic micrometeorites: a new window on the solar system origin", March 30th.

9. Beatrix Hiesmayr (Masaryk Univ., Institute for Theoretical Physics and Astrophysics, Czech Rebublic):
"Testing Foundational Issues at DAPHNE" , April 5th.

10. J. R. Lloyd (Manchester Univ.) :
"Harnessing microbial processes for the bioremediation of radioactive waste", April 23rd.

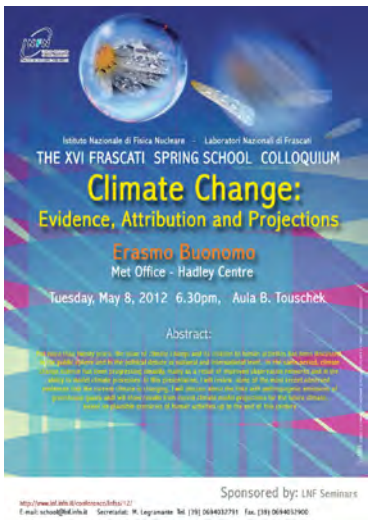

Figure 5: *Poster of the LNF Spring School Colloquium*

11. Erasmo Buonomo (Hadely Centre for Climate Changes):
"Climate Changes", May 8th (see poster in Fig. 5).

12. M. Muhlleitner (Karlsruhe, Inst. Technology):
"Electroweak symmetry breaking and the LHC", May 9th.

13. Gilad Perez (CERN and Weizmann Institute of Science) :
"The flavour physics at the LHC era , I, II", May 10th-11th.

14. Rodolfo Bonifacio (University of Strathclyde) :
" Quantum effects in Compton Back-scattering", May 17th.

15. Patrik Frank (SLAC) :
"Do we know the Temperature of Earth?", May 31st.

16. Nicolae-Victor Zamfir National Institute for Physics and Nuclear Engineering (IFIN-HH), Bucharest, Romania):
"ELI-NP Peoject", June 6th.

17. Victor Malka (CNRS):
" Laser Plasma Accelerators", June 6th.

18. Victor Malka (CNRS):
"Ultra-bright X ray sources with Laser Plasma Accelerators", June 8th.

19. Claude Duhr (ETH Zurich) :
"From Hopf algebras to Feynman Integrals", June 26th.

20. Gabor Somogyi (Hungarian Academy of Sciences):
"Higher-Order QCD Calculations via local subtraction", June 27th.

21. Mauro Mezzetto (INFN-PD):
"Prospettive future per esperimenti di neutrini short e long baseline", July 2nd.

22. Delia Hasch(INFN-LNF) : "Highlights from ICHEP2012", July 19th.

23. David Hertzog (University of Washington):
"Next-Generation Muon g-2", September 3rd.

24. Andrei Linde (Stanford University):
"Inflation in String theory and Supergravity", September 18th.

25. Pantaleo Raimondi (ESRF):
"The Upgrade Project for ESRF", October 15th.

26. Massimo Giovannozzi (CERN):
"Dynamic aperture studies for LHC and its upgrade", October 18th.

27. Rui de Oliveira (CERN):
"Gem, Micromegas and thick GEM production at CERN", October 25th.

28. Piergiorgio Picozza (Università di Roma2 and INFN-RM2) :
"Studying Cosmic Rays with Space Experiments", October 29th.

29. Francesco Vissani (INFN-LNGS):
"Progress and Prospects in Neutrino Astronomy", November 22nd.

30. Rob Bernstein (FNAL) :
" A Search for Charged Lepton Flavor Violation in Muon-Electron Conversion with a Sensitivity $< 10^{-16}$ ", December 4th.

31. Paride Paradisi (CERN) :
"Flavor Physics in the LHC era", December 6th.

32. Orfeu Bertolami Neto (Porto University):
"Phenomelogical and Theoretical Aspects of Modified Theories of Gravity with Non-Minimal Coupling between Curvature and Matter", December 7th.

All these seminars have been organized by the LNF Seminars Committee; we funded most of them, the rest have been co-funded with different budget.