Pernié Luca

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CAREER & EDUCATION

POSTDOCTORAL FELLOW IN HIGH ENERGY PHYSICS
Texas A&M University
2015-present

PH.D. IN HIGH ENERGY PHYSICS
Université Libre de Bruxelles
Universitá di Roma La Sapienza
2011-2015

MASTER'S DEGREE IN PARTICLE PHYSICS
Universitá di Roma La Sapienza
2006-2011

SKILLS

COMPUTING:
Phyton • C • C++ • Bash • LaTeX• Git • SVN

LIBRARIES:
Keras • Theano • numpy • SciPy • pandas

LANGUAGES:
Italian • English • Spanish • French (basic)

INTERPERSONAL SKILLS:
Leadership • Management • Working under pressure • Event Planning • Effective Communication • Public Speaking

AWARDS

2017 CMS Achievement Awards: outstanding contribution to the MUON project in CMS.

Postdoctoral research symposium: distinguished postdoctoral flash talk, Texas A&M University

One year grant as CERN-INFN associate (CERN fellow position)

INTERESTS

Experimental High Energy Physics
Data analysis
Deep Learning
Software Engineering
Management

EXPERIENCE

LEADERSHIP AND SERVICE
Alignment, Calibration and Databases manager. This role is an L2 management position under the Physics Performance Dataset project. Responsibilities include the coordination of all the activities related to production and consumption of detector conditions.

Member of the Muon Detector Performance Group Office. The group is charged with the coordination of the several muon detector subsystems to have the best performance of the muon system.

PHYSICS ANALYSIS
Coordinator of the search for beyond the Standard Model light bosons decaying into muon pairs.

Coordinator of the search for resonant di-Higgs production in the $H \to hh \to WWbb \to ll\nu\nu bb$ decay channel.

Measurement of the Z boson pair-production cross section in proton-proton collisions at 7 and 8 TeV.

Search for the Higgs boson in the H $\to$ ZZ $\to$ 2l2ν decay channel in pp collisions with the CMS detector.

Search for High mass Higgs boson into the $WW \to WW \to l\nu jj$.

DETECTOR & INSTRUMENTATION
Responsible of the track-based alignment of the CMS muon system.

Radiation hardness studies for the High Luminosity upgrade of the CMS muon system.

Developed a framework for the inter-calibration of the CMS electromagnetic calorimeter crystals through neutral pions.

Studies of the impact of precise timing for the phase-2 upgrade of the CMS experiment.

OUTREACH ACTIVITY

Machine Learning Techniques in Science (organizer): three seminars with the purpose of offering an opportunity for graduate students and postdocs to get a kick-start into being able to apply ML technique.

High Energy Physics Experiment Cosmology seminar (organizer): a series of seminars attended by the members of both the experimental and theory communities, including faculty, postdocs, researchers, graduate and undergraduate students of Texas A&M University.

A walk through the Large Hadron Collider (organizer): part of the Physics and Engineering Festival at Texas A&M University that gathers over 5000 visitors annually from across the United States.

Official guide of the CMS experiment: tours of the CMS experimental facility in English, Spanish, and Italian.

SELECTED PUBLICATIONS

Full list of publications (over 400 as a member of CMS Collaborations) is available upon request, or it can be accessed through this link.

REFEREED JOURNAL PUBLICATION

Huang T., Pernié L. et al., "Resonant Di-Higgs Production in the bbWW Channel: Probing the Electroweak Phase Transition at the LHC", Phys. Rev. D 96 (2017).
CMS Collaboration, "A search for beyond the Standard Model light bosons decaying into muon pairs at CMS", paper in preparation.
CMS Collaboration, "Track-Based Alignment of the CMS Muon System.", paper in preparation.
CMS Collaboration, "Measurements of the ZZ production cross sections in the $2l2\nu$ channel in proton-proton collisions at $\sqrt{s}$ = 7 and 8 TeV and combined constraints on triple gauge couplings", Eur. Phys. J. C 75 (2015).
Brianza L., Pernié L. et al., "Response of microchannel plates to single particles and to electromagnetic showers, NIMA vol. 797 (2015).
CMS Collaboration, "Track-based alignment of the CMS muon system, paper in preparation.
CMS Collaboration, "h to aa to 2mu2tau with 2016 dataset", analysis review committee, HIG-17-029, To be submitted.
CMS Collaboration, "Search for SUSY with multileptons in 13 TeV data", analysis review committee, CERN-EP-2017-243, Submitted to JHEP.
ATLAS Collaboration, "Search for dark matter produced in association with a Higgs boson decaying to bb using 36 fb^{-1} of pp collisions at $\sqrt{(s)}$ = 13 TeV with the ATLAS detector", External referee, CERN-EP-2017-117, Submitted to Phys. Rev. Lett.
CMS Collaboration, "Search for a Higgs boson in the mass range from 145 to 1000 GeV decaying to a pair of W or Z bosons", J. High Energy Phys. 10 (2015).
CMS Collaboration, "Search for a standard-model-like Higgs boson with a mass in the range 145 to 1000 GeV at the LHC", Eur. Phys. J. C 73 (2013).

SELECTED INTERNATIONAL CONFERENCES

A more extensive list of confrences can be found in my CV, available at this link.

12/2017. Mumbai, India. SUSY17: 25th International Conference on Supersymmetry and the Unification of Fundamental Interactions. Title: Searches for long-lived particles and other non-conventional signatures.

06/2017: Madrid, Spain. PASCOS17: PArticle physics, String theory and COSmology, Madrid. Title: Searches for extended Higgs sectors with the CMS experiment.

02/2017. Santa Fe, New Mexico: Jets and Heavy Flavor 2017, Los Alamos National Laboratory. Title: CMS measurements of the Higgs, Higgs properties, and BSM searches.

05/2016: Pittsburgh. Pheno2016: Phenomenology 2016 Symposium. Title: Extended Higgs searches at the CMS experiment.

05/2016. College Station, Texas: Mitchell Workshop on Collider and Dark Matter Physics. Title: Search for Beyond Standard Model Higgs with the CMS experiment.

01/2016. University of Massachusetts Amherst. Invited seminar. Title: Resonant Di-Higgs Production in the bbWW Channel: Probing the Electroweak Phase Transition at the LHC.

03/2015. CERN, Switzrland: LHCC (poster session). Title: Simulation studies on precise timing information during High Luminosity LHC.

09/2013: Como, Italy: 14th ICATPP Conference on Astroparticle, Particle, Space Physics and Detectors for Physics Applications. Title: Evolution of the response of the CMS ECAL, and upgrade design options for electromagnetic calorimetry at the HL-LHC.

08/2013: Moscow, Russia: 16th Lomonosov Conference on Elementary Particle Physics; ZZ cross section measurements and limits on anomalous coupling constants for neutral triple gauge boson.