

# CURRICULUM VITAE

Dott. Michele Bianco

Awards and honors	
December 2009	<b>Marc Virchaux Prize</b> <i>For outstanding PhD theses concerned with the ATLAS Muon Spectrometer</i>
Employment and career	
May 2013-present	<b>CERN Fellow</b> CERN Geneva Switzerland
July 2014-present	<b>Responsible for the ATLAS Micromegas DAQ system</b>
April 2008-March 2012	<b>Post Doc.</b> <i>Monitoring and calibration of ATLAS Barrel trigger chambers at CERN Large Hadron Collider.</i> Università del Salento – Lecce (Italy)
2008-March 2013	<b>Responsible for ATLAS RPC DataQuality Assesment</b>
July 2009	<b>Passed the selection for L.D. position (Limited Duration ) at I.N.F.N (Istituto Nazionale Fisica Nucleare) Italy</b>
July 2008-August 2009	<b>Special INFN-CERN Associate Programme in the Framework of the LHC: Monitoring and calibration of ATLAS RPC</b>
Teaching activities	
August-October 2011	<b>Co-supervisor for a Master's Degree Thesis in Physics at the University of Salento</b> <i>Candidate Alessandro Mirto - Title "Data Driven Measurement for Charge Flip Rate in Z boson decay at the ATLAS experiment"</i>
2009-2012	<b>Lecturer Strumentazione per la Fisica Nucleare e Subnucleare</b> Università del Salento – Lecce (Italy)

## Education and training

<p><b>July 2007</b></p> <p><i>Principal subjects / occupational skills covered</i></p>	<p><b>PhD in Physics</b>  <b>Università del Salento – Lecce (Italy)</b>  <i>Supervisor: Prof. E. Gorini, Dott G. Chiodini</i></p> <p><b>High Energy Physics</b>  <b>Title “ATLAS RPC certification and commissioning with cosmic ray ”</b>  <i>Characterization of the RPC properties with high statistic sample, Particular attention has been devoted to the operation of the RPC detector at high temperature.</i>  <i>The thesis also documents contributions to the commissioning of the detector, showing the first results ever obtained from RPC chambers installed in sector 13 of the ATLAS Muon Spectrometer.</i></p>
<p><b>Dec 2004</b></p>	<p><b>Joined the PhD in Physics at Università del Salento – Lecce (Italy)</b></p>
<p><b>Dec 2004</b></p>	<p><b>Passed the selection for a two years grant at “ENEL (Centrale Federico II)” (ENEL) Ente Nazionale Energia Elettrica (Italy) “ Operator renewable energy”</b></p>
<p><b>Sept 1998 – July 2004</b></p> <p><i>Principal subjects / occupational skills covered</i></p>	<p><b>Università degli studi di Lecce – Lecce (Italy)</b>  <i>Supervisor: Prof. E. Gorini, Dott G. Chiodini.</i></p> <p><b>Degree in Physics</b>  <b>Thesis title “ DAQ System for the ATLAS RPC Teststand in Lecce and preliminary detector test results”.</b>  The DAQ system for the facility built in the Lecce INFN and Physics Department High Energy Laboratory to test part of the Resistive Plate Counters (RPCs) of the ATLAS barrel muon spectrometer is realized. In this cosmic ray test stand I operated the chambers for the first time, after having assembled and equipped them with all gas services and electrical connections.  A complete set of measurements has been performed on each chamber in order to certify its quality and performances before the installation in the experiment.</p>

Schools	
<p><i>Dates (from – to):</i></p> <p><b>Aug 2006 (9 - 18)</b></p> <p><b>June 2006 (8-12)</b></p> <p><b>Aug-Sept 2005 (18 - 3)</b></p> <p><b>June 2005 (9 - 14)</b></p> <p><b>Sept 2004 (20 - 26)</b></p> <p><b>May 2004 (20 - 26)</b></p>	<p><b>Hadron Collider Physics Summer School (CERN – FERMILAB)</b> <i>FERMILAB – Chicago (USA)</i></p> <p><b>Italo-Hellenic School of Physics</b> “The Physics of LHC: theoretical tools and experimental challenges” (<i>Università degli studi di Lecce</i>) <i>Martignano – Lecce (Italy)</i></p> <p><b>The 13<sup>th</sup> European School of High Energy Physics (CERN – JINR)Kitzbühel, (Austria)</b></p> <p><b>Italo-Hellenic School of Physics</b> “The Physics of LHC: theoretical tools and experimental challenges” (<i>Università degli studi di Lecce</i>) <i>Martignano – Lecce (Italy)</i></p> <p><b>XVII Seminario Nazionale di Fisica Nucleare e Subnucleare</b> <i>Otranto (Italy)</i></p> <p><b>Italo-Hellenic School of Physics</b> “The Physics of LHC: theoretical tools and experimental challenges” (<i>Università degli studi di Lecce</i>) <i>Martignano – Lecce (Italy)</i></p>
Conferences	
<p><b>July 2014 (17 - 24)</b></p> <p><b>Apr 2012 (16 - 20)</b></p> <p><b>Oct 2009 (5 - 9)</b></p>	<p><b>EPS HEP 2013</b> Stockholm (Sweden) <b>Talk: “Development of large size Micromegas detectors for the upgrade of the ATLS experiment”</b></p> <p><b>Second MCTP Spring Symposium on Higgs Boson Physics</b> University of Michigan, Ann Arbor, Michigan (USA) <b>Talk: “Searches for Supersymmetry at ATLAS”</b></p> <p><b>11<sup>th</sup> ICATPP “Conference on Astroparticle, Particle, Space Physics, Detectors and Medical Physics Applications”</b> <i>Como (Italy)</i> <b>Talk “Performance of the Resistive Plate Chambers as LVL1 ATLAS muon trigger detectors”</b></p>

<i>June 2008 (25 -28)</i>	<b>XXVIII PHYSICS IN COLLISION</b> <i>Perugia (Italy)</i> <b>Invited talk</b> "Status of the ATLAS RPC commissioning and cosmic test results"
<i>Feb 2008 (13 - 16)</i>	<b>RPC2008</b> "The IX International Workshop on Resistive Plate Chambers and Related Detectors" <i>Mumbai (India)</i> <b>Talk</b> "ATLAS RPC certification with cosmic rays"
<i>May 2006 (21 -26)</i>	<b>X Pisa Meeting on Advanced Detectors</b> <i>Porto Ferraio, Elba Island (Italy)</i> <b>Poster</b> "Preliminary performance results for the ATLAS RPC test stand in Lecce"
<i>Oct 2005 (17 - 21)</i>	<b>9<sup>th</sup> ICATPP</b> "Conference on Astroparticle, Particle, Space Physics, Detectors and Medical Physics Applications" <i>Como (Italy)</i> <b>Poster</b> "The ATLAS RPC test stands"
<b>Seminars</b>	
<i>June 14, 2010</i>	Invited speaker at ATLAS Italia plenary meeting: <b>"Muon Detection Looking at the first data "</b> <i>Sestri Levante (Italy)</i>
<i>May 19, 2011</i>	Invited speaker at ATLAS Italia plenary meeting: <b>"SUSY Analysis in Italy: Status Report "</b> <i>Naples (Italy)</i>
<b>Personal skills and competences</b>	
<i>Mother tongue:</i>	<b>Italian</b>
<i>Other languages:</i>	<b>English</b> (Upper intermediate)
<i>Technical skills and competences:</i>	<ul style="list-style-type: none"> <li>⊗ Languages: C, C++, bash/tcsh</li> <li>⊗ ROOT / data analysis software</li> <li>⊗ Environment: MS Windows, Linux</li> <li>⊗ Labview</li> <li>⊗ High competence in PC use</li> </ul>
<i>Interests:</i>	IT (computer, internet, technology), Economy

*Strengths:*

Hard working, fast learner, organized team player

## Research Activity

In 2002-2012 I worked with the High-Energy Physics group at the Physics Department of the Salento University at Lecce, Italy. This group is actively involved since 1994 on the ATLAS Muon Spectrometer and its main activities are: RPC construction, testing, commissioning, operation, maintenance, monitoring, data quality and performance, muon High Level Trigger development and performance studies, muon core software development and analysis of SUSY candidate events with two leptons in the final state.

In 2013 I got a position as Fellow at CERN laboratories join to the group involved in the Micromegas project for the upgrade of the ATLAS Muon Spectrometer

I obtained a master degree in Physics at University of Lecce in September 2003, presenting a thesis "*DAQ system for the ATLAS RPC Test stand in Lecce and preliminary test results*".

During thesis period, I realized, for the test stand facility all the necessary hardware infrastructure to operate and test the detector and the DAQ system. This Test Stand was built to test part of the ATLAS barrel muon spectrometer Resistive Plate Chambers (RPCs) detectors, and during this period I had the opportunity to acquire considerable knowledge of hardware and software tools used in high energy physics.

In December 2003 I passed the exam to access the Physics PhD at University of Salento, then I started my PhD Thesis focusing my activities on the RPC detector characterization.

I tested more than 300 RPC chambers (about 1/3 of the entire production) using cosmic rays. The test took more than 18 months, and provided a complete set of measurements which permitted to certify RPC chambers quality before final installation on the experiment.

During 2003 and 2004 I was also deeply involved in RPC Test Beam at the H8 CERN facility, in particular I worked to set up the experimental infrastructure and the data monitoring facilities.

In 2005/2006 I participated in the ATLAS Muon Station assembly and certification at the CERN BB5 facility and at the end of this work I moved to the final commissioning of the ATLAS Muon Spectrometer. With this work I completed (2007) my PhD thesis "*ATLAS RPC certification and commissioning with cosmic ray*" for which, in 2009, have been awarded with Marc Virchaux Prize.

In 2008 I obtained a Post Doc at University of Salento, and at the same time I was also recruited for limited duration contract at CERN as *Special INFN-CERN Associate Programme* in the framework of the LHC, with a specific work subject *Monitoring and calibration of ATLAS RPC detector*.

Due to the constant presence at CERN and the large amount of work done on RPC monitoring and Data Quality Offline since 2008 I became responsible for the whole RPC Data Quality Assessment Group which also include the Online and DCS part, and I still cover this role.

Since the end of the commissioning phase of the ATLAS Muon Spectrometer to date, I have always been constantly involved in the maintenance and development of the hardware Muon system.

Alongside the work on the detector, since 2010 I am also involved in data analysis concerning inclusive SUSY searches and in particular in the channel having two lepton in the final state.

Profiting from my knowledge of the Muon Spectrometer and my experience in the Trigger System, using the 2010 data, I performed efficiency studies of trigger chains in events with leptons using both TrigMuGirl and TrigMuonEF algorithms.

In 2011, after developing the basic cut flow for the SUSY Two Leptons Analysis, I focused my attention to one of main backgrounds related to this analysis: the same sign charge event produced via flip charge due to hard Bremsstrahlung.

We investigated the possibility to extract this information directly from the data (Data Driven Mode). This work was also the subject of a Degree Thesis "*Data Driven Measurement for Charge Flip Rate in Z boson decay at the ATLAS experiment*", for which I have been co-supervisor.

Finally, during last year, I was involved in the SUSY search working on Direct Stop Production Analysis, as subgroup of the ATLAS Two Leptons SUSY group.

In November 2013 I have been selected as CERN Fellow and since May 2014 I'm involved in to the design, construction, test and characterization of the Micromegas (MMs) detector, which has been chosen for the upgrade of the ATLAS Muon spectrometer in the forward region.

In particular, I deal with the characterization of prototypes of MMs detectors in order to give you a quick feedback to the engineers and physicists involved in to the optimization of the design of the detectors that will be installed in the experiment ATLAS.

For this purpose, in the laboratory of the RD51 collaboration at CERN, I have designed, built and put into operation a test station capable to certify large area MMs (up to  $2.6 \times 2 \text{ m}^2$ ).

To test and certify the detectors I built a DAQ system based on Scalable Readout System (SRS) technology developed at CERN inside the MPGD collaboration. I'm improving such a system for large scale applications using the Advanced Telecommunications Computing Architecture (ATCA) platform.

The DAQ system, which I developed, has been already successfully used in simple setups (e.g. cosmic stands ) and during the MMs test beams at CERN in 2014.

An adapted version of such a system will be integrated in to the ATLAS DAQ system where will be used to readout of a Micromegas prototype during the Run II phase.

Due to my effort in this project, in July 2014 I have been designated as responsible for the DAQ system of the whole MMs community.

Alongside development activities of the Micromegas detector, I contribute to the analysis of the search for supersymmetric particles (SUSY). In Particular I'm involved in the search for heavy partner of the top quark in events with two leptons in the final state, assuming the decay of the top quark and stop in a neutral particle.

In order to extend the limits Observed by previous Analyzes based on the method of cut-and-count, I have Contributed to the realization of an innovative analysis based on the multivariate methods (MVA).

Starting from the variables used in the standard analysis:  $m_{ll}$ ,  $m_{\text{eff}}$  and  $m_{T2}$ , a new multivariate variable with the highest separation power of signal / background has been introduced. This analysis

performed on the 20 fb-1 of statistics collected by the ATLAS experiment in 2012 has extended the exclusion limits of stop squark in the literature [JHEP 06 (2014) 124].

Nardò 20/08/2014

Michele Bianco



**Tutto quanto dichiarato corrisponde a verità ai sensi degli art. 46 e 47 del D.P.R. 28 dicembre 2000, n. 445 e successive modificazioni ed integrazioni**