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Education and Experience

Research Assistant, Royal Holloway, University of London, 2011 - Present

Postdoctoral Research Scientist, Nevis Laboratories, Columbia University, 2006 - 2011

Fellow, CERN, European Organization for Nuclear Research, 2004 - 2006

Ph.D., Physics, The University of Chicago 2000 - 2004

J. E. Pilcher, advisor

Thesis: *“Measurement of the mass and width of the W boson using the full data sample from the OPAL detector at LEP”*

Compulsory National Service, May 1999 - Jan 2000

Civil servant (conscientious objector), Radiology Unit - Italian National Health Service - Unit 7, Siena (Italy)

Degree, Physics (“Laurea in Fisica”), University of Pisa, 1993 - 1998

(grade: 110/110)

V. Cavasinni, advisor

Thesis: *“Study of the measurement of the Higgs Boson with a mass between 300 and 600 GeV in the ATLAS experiment at the LHC”*

Scholarships and Support

Research Assistantship - The University of Chicago (2000 - 2004)

Full tuition merit scholarship - The University of Chicago (2000 - 2004)

Full tuition scholarship - University of Pisa (1996 - 1998) (merit-income based)

Honors

2004 Yodh Prize for the best graduate student in experimental physics - Department of Physics - The University of Chicago

2004 Sugarman Award for excellence in graduate research - Enrico Fermi Institute
- The University of Chicago

Research Experience

Research Assistant, Royal Holloway, University of London, 2011 - Present (based at CERN - European Organization for Nuclear Research)

- Member of the ATLAS collaboration. Member of the ATLAS Top Working group and of the Top reconstruction and Top Cross section sub-groups.

Co-editor of the paper (to be submitted to Eur. Phys. J. C) describing the first measurement the differential cross section for production of top/anti-top pair as a function of the mass ($d\sigma/dm_{t\bar{t}}$) and rapidity ($d\sigma/dy_{t\bar{t}}$) of the top/anti-top system using the data set collected in 2011 up to summer by the ATLAS detector in proton-proton collisions at 7 TeV in the center of mass (\sqrt{s}) at the Large Hadron Collider (LHC) (CERN, Geneva) with an integrated luminosity of about 2.05/fb (May 2011- Present). *Leading* the efforts of a focused group of ten analyzers to define the measurements and the analyses strategy in all their aspects. *Writing and editing* the paper and the supporting internal documentation. *Representing* the group in the general ATLAS Top Group meetings and in the ATLAS Top cross section meetings. *Contributor* to the definition of the scheme for unfolding the detector effects for the result of the top/anti-top mass distribution.

Statistics Contact for the ATLAS Top Group (July 2011 - Present). *Liaison* between the ATLAS Top group and the ATLAS statistics forum. *Co-organized* topical joint two-day workshop on unfolding techniques in top and standard model ATLAS analyses in October 2011.

Postdoctoral Research Scientist, Nevis Laboratories, Columbia University, 2006 - 2011 (based at CERN - European Organization for Nuclear Research)

- Member of the ATLAS collaboration. Member of the ATLAS Top Working group and of the Top reconstruction, Top Cross section and Top Properties sub-groups.

Contributor to the search for new resonances in mass distribution of the top/anti-top quark system, using the full data set collected in 2010 by the ATLAS detector in proton-proton collisions at 7 TeV in the center of mass (\sqrt{s}) at the Large Hadron Collider(LHC) (CERN, Geneva) with an integrated luminosity of 35/pb (preliminary results presented at Physics the LHC, Perugia, 2010). *One of the initiators* of the analysis to observe the first candidates for high p_T top quarks reconstructed single jet in events with high top/anti-top mass (results with 2010 data documented in ATLAS communication).

Developer and user of software tools and analysis techniques (kinematic fitters) for the reconstruction and observation of the top quark signal and the measurement of top properties sensitive to new physics, in particular the mass spectrum of the top/anti-top system ($dN/dm_{t\bar{t}}$) (results on $dN/dm_{t\bar{t}}$ published in the ATLAS book on “*Expected Performance of the ATLAS experiment*”).

Significant contributor to the measurement of the top quark-pair production cross section with the first data set collected by the ATLAS detector in proton-proton collisions at $\sqrt{s} = 7$ TeV at the LHC (results published in Eur. Phys. J. C) in

the capacity of

Co-editor and co-organizer of the activities/studies for the ATLAS internal note “Jet Selection for Top Physics” (40 (forty) authors), supporting/basic document on the properties of jets (quality, reconstruction efficiency, jet energy scale and its uncertainty) used to perform the measurement (March 2010 - November 2010) (also contributing to results on jet energy measurement with ATLAS submitted to Phys. Rev. Lett.). *Contributor* to the note with studies on the comparison of the different jet calibration schemes, aimed at the choice of the baseline calibration scheme.

- Member of the ATLAS Collaboration and the Liquid Argon Calorimeter (LAr) collaboration.

LAr representative in the ATLAS Data Quality (DQ) group (July 2008 - September 2009).

Co-coordinator (and developer) of the combined physics monitoring in the LAr Data Quality group (July 2008 - January 2010) (combined effort of the Liquid Argon and Tile Calorimeter groups). Co-led a group of five physicists to develop, maintain and document offline and online software tools to monitor the quality of the reconstruction of data describing calorimeter’s cells, towers and clusters. *Organized* coherent assessment of the quality for cells and clusters. Liaison with full ATLAS DQ community. *Suggested* additional variables to monitor the quality, *conceived the base strategy* for automatically combining the monitored information and *suggested* tools for their software implementation.

Expert LAr shifter, participated in all ATLAS combined cosmics data-taking for commissioning from 2006 on and in the collisions data taking from 2009 on.

- Played leading role in ATLAS Hadronic Calibration working group. *Refined and documented* one’s own newly devised hadron calibration technique for combined ATLAS calorimetry (LAr and Tile). Results published in JINST, presented at CALOR08 (and partially published in associated proceedings), reported in ATLAS public note.
- Member of the OPAL collaboration at LEP (WW physics group)

Fellow, CERN, European Organization for Nuclear Research, 2004 - 2006

- Member of the ATLAS Hadronic Calibration working group.
Co-deviser of new calibration scheme for hadrons in combined calorimetry (LAr and Tile).

- Member of the ATLAS Collaboration in the Tile Calorimeter. Member of the ATLAS CERN Calorimetry group.

Deviser of new simulation technique to map full TileCal electronic noise pattern. Results published in ATLAS public note.

Co-coordinator of the integration phase of ATLAS Tile Calorimeter with other ATLAS subsystems (Level 1 Calorimeter Trigger, Liquid Argon Electromagnetic Calorimeter, Data Acquisition, Detector Control System). Contributed to testing front-end electronics.

Experienced Tile shifter, intense participation to data-taking in 2004 ATLAS combined test beam.

- Member of the ATLAS Offline reconstruction group for ATLAS Combined Test Beam in 2004. Contributed to data offline reconstruction and to testing reconstruction quality for ATLAS Tile Calorimeter.
- Member of the OPAL collaboration at LEP (WW physics group)

Research Assistant, Enrico Fermi Institute, University of Chicago 2000-2004:

- Member of the WW physics group in the OPAL experiment at LEP. Participated in detector operation and data collection. *One of six main contributors to the improved final W mass measurement* using the full data-set collected by the OPAL experiment. Detailed study of systematic effects. Results published in Eur. Phys. J. C. Advisor: James Pilcher (Univ. of Chicago)
- Member of the ATLAS Collaboration (Tile Calorimeter). *Analyzed* performance of Tile calibration system, *contributed* to electronics radiation tests and *participated in data taking* with beam test.

Student Associate, Istituto Nazionale di Fisica Nucleare, Sezione di Pisa 1997-1998:

- Member of the ATLAS collaboration. *Improved ATLAS potential for observation of Higgs boson signal in dominant decay for high Higgs masses* ($pp \rightarrow H \rightarrow WW \rightarrow l\nu jj$) in simulated events recorded with the ATLAS detector (Higgs mass range 300-600 GeV). Results published in first ATLAS Technical Design Report. Advisor: Vincenzo Cavasinni (INFN and University of Pisa)
- *Participated in data taking* for Tile Calorimeter tests with beam and *analyzed 1997 data* to derive resolution and linearity in response to hadrons.

Teaching

- F. Spanò, Lecture on “*Top Quark at LHC*” at the 2011-2012 Intercollegiate Post-Graduate Course in Elementary Particle Physics, London, UCL Bloomsbury Campus, 15th November 2011, organized by the High Energy Physics groups of Brunel University, Queen Mary and Westfield College - University of London, Royal Holloway-University of London, University College London

Mentoring and Supervising

- December 2011- Present - Collaborating with Tim Brooks (R. Holloway, U of London) on the development of a data-driven technique to assess $t\bar{t}$ background for SUSY searches in di-lepton events.
- June 2011 - Present: collaborating with Nancy Tannoury (Ph.D. candidate at CPPM Marseille), Miho Yamada (Ph.D. candidate at KEK, Tokyo) on the measurement of differential cross section for production of top pairs as a function of top/anti-top mass ($d\sigma/dm_{t\bar{t}}$) using data collected by ATLAS in 2011: both for the first ATLAS paper on the topic to be submitted to Eur. Phys. J. C with 2 fb^{-1} of integrated luminosity and on the extended result using the full integrated luminosity (5 fb^{-1}) collected in 2011 .

- June 2011 - Present: partially collaborating with Dustin Urbaniec (Ph.D. candidate at Columbia University) on top reconstruction, unfolding schemes for top in measuring differential cross section of extra jet production in top/anti-top dilepton channel production.
- May 2009 - April 2011: Collaborated with Dustin Urbaniec (Ph.D. candidate at Columbia University) on top quark reconstruction and first measurement of cross section of top quark pairs with the ATLAS detector.
- May 2009 - April 2011: Collaborated with Karl Johan Grahn (Ph.D. Candidate, KTH Stockholm) to complete paper on novel hadronic calibration scheme (now published in JINST).
- August 2008 - January 2010: Collaborated with two Ph.D. Candidates on ATLAS calorimeter data quality: data quality for LAr calorimeter cells with Evan Wulf (Columbia University) and data quality for combined calorimeter clusters and towers with Ram Dhullipudi (Louisiana Tech).
- June 2004 - April 2009: Collaborated with two Ph.D. Candidates on ATLAS hadronic calibration studies: Peter Speckmayer (Technical University, Wien) and Karl Johan Grahn (KTH Stockholm).
- July 2009: *Supervisor* for Steve Hancock (Columbia University - Rabi scholar): study properties of jets reconstructed by the ATLAS detector in semi-leptonic top/anti-top ($t\bar{t}$) events at the LHC to build discriminating observables for choice of best jets for final state reconstruction.
- July - September 2007: *Supervisor* for Wu Wai Ling (University of Michigan): jets calibration performance in W mass reconstruction from $t\bar{t}$ events using the ATLAS detector at LHC.
- July - September 2005: *Supervisor* for Paolo Francavilla (University of Pisa): analysis of cluster classification in single pion events aimed at development of a local hadronic calibration scheme for the 2004 ATLAS Combined Test Beam. *Supervisor* for Kartan Thor Wikfeldt (Stockholm University): development of a weighting scheme and analysis of dead material corrections in a local hadronic calibration scheme for the 2004 ATLAS Combined Test Beam.
- July - September 2004: *Supervisor* for Catrin Bernius (University of Mainz): tests of front-end electronics for the ATLAS Tile Calorimeter

Organizational activity and Outreach

- Co-convenor (with H. Hadavand (SMU Dallas)) of the Combined Physics session of the ATLAS Liquid Argon Data Quality workshop, CERN, 21st-22nd, July 2008
- Co-convenor (with D. Pallin (LPC Clermont Ferrand)) of the session devoted to “ $t\bar{t}$ selection, top mass reconstruction, QCD background, analysis tools” in the ATLAS Workshop on Refinement of Local Hadronic Calibration and its Application to Top Physics, Ringberg Castle (Munich), Germany, 11th-14th June, 2008

- Volunteer guide at the ATLAS site (Meyrin - CERN) during the 2008 CERN Open day (6th April)
- Co-convener (with S. Menke (MPI Munich)) of the “*Hadronic Scale*” Session of the ATLAS Hadronic Calibration Workshop, Milano, Italy 26th-27th April 2007
- Volunteer guide at the 2004 Combined ATLAS Test Beam site (Preveessin - CERN) during the 2004 CERN Open day (16th October)
- Organizer of the OPAL Plenary Week, CERN, 22nd - 24th September 2003

Professional Service

Reviewer for one ATLAS physics internal note in 2010 (later approved to be public).
Reviewer for two ATLAS TileCal internal notes in 2005 and 2010.
Member of two OPAL editorial boards in 2006-2007 and in 2008.

Presentations/attendances at Conferences/Workshops

- F. Spanò (on behalf of the ATLAS collaboration), “*Searches for new physics in top-quark final states at ATLAS*”, BSM 4 LHC UK Workshop, Institute for Particle Physics Phenomenology (IPPP), Durham, UK, 11th-13th January 2012
- F. Spanò (on behalf of the ATLAS and CMS collaborations), “*Top quark production at the LHC*”, XXXI Physics in Collision, Vancouver, Canada, 28th August-1st September 2011
- F. Spanò, “*Fisica del Top quark con ATLAS ad LHC*”, INFN/University of Bologna Seminar, 15th June 2011
- F. Spanò, “*Fisica del Top quark con ATLAS ad LHC*”, INFN/University of Pisa Seminar, 3rd May 2011
- F. Spanò, “*Towards new physics with Top quark with ATLAS @ LHC*”, Top Mini Workshop, Weizmann Institute of Science (Rehovot, Israel), 30th May 2011
- F. Spanò, “*Top Physics at ATLAS*”, CPPM Seminar, Marseille, 11th April 2011
- F. Spanò, “*Top Physics at ATLAS*”, LPSC Seminar, Grenoble, 31st March 2011
- F. Spanò, “*Top Physics at ATLAS*”, LPHNE Seminar, Paris, 24th March 2011
- F. Spanò (for the ATLAS and CMS collaborations), “*Top Physics at ATLAS and CMS*”, XLIII Recontres de Moriond - QCD and High Energy Interactions, La Thuille, Italy, 14th - 21st March 2009
- F. Spanò (for the ATLAS collaboration), “*Test of the ATLAS Pion Calibration Scheme in the ATLAS Combined Test-Beam*”, CALOR08 XIII International Conference on Calorimetry in High Energy Physics, Pavia, Italy, 26th - 30th May 2008
- T. Carli, K.J.Grahn, F Spanò, P. Speckmayer, “*Hadron Calibration at the 2004 Combined Test Beam*”, ATLAS Hadronic Calibration Workshop - Tucson, Arizona, USA, April 2008, (presented by K. J. Grahn)

- ATLAS Workshop on Refinement of Local Hadronic Calibration and its Application to Top Physics, Ringberg Castle (Munich), Germany , 11th-14th June, 2008,
- F. Spanò, “*Hadronic Scale Session Discussion*”, ATLAS Hadronic Calibration Workshop, Milano, Italy, 26th-27th April 2007
- ATLAS Calorimeter Calibration Workshop, Costa Brava, Spain, 5th-8th September 2006
- ATLAS Hadronic Calibration Workshop, Munich, Germany, 3rd-5th May, 2006
- F. Spanò (for the LEP Collaborations), “*Standard Model Electroweak Measurements at LEP*”, XLI Recontres de Moriond - Electroweak Interactions and Unified Theories, La Thuille, Italy, 11th - 18th March 2006, (on behalf of the LEP collaborations)
- F. Spanò (for the ATLAS collaboration), “*ATLAS Physics Potential*”, 4th International Workshop “*Quantum Particles and Fields*”, Zagulba Settlement, Baku, Azerbaijan, 19th - 24th September 2005
- F. Spanò “*Local Hadron Calibration*”, ATLAS Physics Workshop, Rome, 6th-11th June 2005
- F. Spanò, “*Study of Weighting from Calibration Hits with a Toy Monte-Carlo*”, ATLAS Calorimetry Calibration Workshop, Tatranská Strba, High Tatra Mountains, Slovakia, 1st-4th December, 2004
- F. Spanò (for the OPAL collaboration), “*W mass and width measurement at LEP*”, 2004 Lake Louise Winter Institute, Lake Louise, Alberta, Canada, 15th-21st February 2004
- F. Spanò, “*Hadronization Studies and UMLBZ*” , WW Workshop, Cetraro, Italy, 13th October 2001
- LHC 2003 - IV International Symposium on LHC Physics and Detectors - Fermilab, USA, 1st-3rd May 2003
- V. Cavasinni, D. Costanzo, S. Lami, F. Spanò, “*Study of $H \rightarrow WW \rightarrow l \nu jj$ at lower masses*” ATLAS Physics Workshop, March 29th - April 4th 1998, Grenoble (France), (presented by D. Costanzo)

Other Presentations

I have produced 209 presentations in the ATLAS and OPAL collaborations about the diverse set of research topics I have tackled: 4 on Higgs physics, 16 on W physics, 110 on top physics (including the search for new resonances) and jet calibration for top events, 2 on statistical methods in high energy physics (unfolding), 14 on TileCal electronics and performance issues, 5 on TileCal Integration issues, 6 on Hadron Calibration, 52 on LAr and combined calorimeter data quality.

Summary of publications

I am co-author of 170 peer-reviewed published papers (81 with the ATLAS collaboration and 89 with the OPAL collaboration), 12 papers accepted for publication, 27 papers submitted for publication and 5 proceedings.

International Schools

57th SUSSP Summer School “*LHC Phenomenology*”, St. Andrews, Scotland, 17th-29th August, 2003

Computer Skills

Operating Systems: Unix, Linux, Windows XP and 2000, Mac OS X
Programming Languages: C++, FORTRAN, Python (basic)
Data Analysis tools: ROOT, PAW, HBOOK
Experience with: LaTeX, HTML, PowerPoint, KeyNote

Languages

Italian : native
English : fluent
French : very good
Spanish : good reading comprehension

Professional Affiliations

American Physical Society 2001-present

References

Prof. Glen Cowan
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