

May 03 2019

Marco Guzzi: Curriculum Vitae

Personal Information

Field of interests

Theoretical Physics, Hadron Collider Phenomenology,
Quantum Field theory of the strong interactions,
BSM Phenomenology.

Current Employment

**Assistant Professor of
Theoretical Particle Physics**
Kennesaw State University
Department of Physics
370 Paulding Ave, #1204
Kennesaw, GA 30144, U.S.A.

Contact details

e-mail address: mguzzi@kennesaw.edu
From Aug 7 2017 to present
Office Phone: +1 470-578-4783
Office number: SC436

Higher education

- **Master degree (Laurea)** in Theoretical Physics, University of Salento, Italy, **July 24, 2002**
 - Thesis: “Perturbative aspects of QCD in the presence of supersymmetry”.
 - Thesis advisor: Prof. Claudio Corianò.
- **Ph.D.** University of Salento, Italy, **September 28, 2006**
 - Ph.D. Thesis: “QCD Studies at Hadron Colliders and in Deeply Virtual Neutrino Scattering”. e-Print: [hep-ph/0612355](https://arxiv.org/abs/hep-ph/0612355)
 - Thesis advisor: Prof. Claudio Corianò.
- **Italian National Scientific Qualification** (Abitazione Scientifica Nazionale) II Fascia, 02/A2 - Theoretical Physics of Fundamental Interactions - FIS/02 Theoretical Physics, Mathematical models and methods Italy, **28/03/2017 - 28/03/2023**

Peer reviewed articles

I have **73** citeable papers available at: <https://inspirehep.net/search?ln=en&ln=en&p=find+a+guzzi>. The total number of my citations is **5936** (as of May 03 2019). My Hirsch "h" index is **25**.

Research Grants

National Science Foundation, PI Grant, “Precision theory at the LHC: strong interaction dynamics and new physics searches”, September 2018-August 2021, \$108,830

Previous positions held

- **Postdoctoral Research associate** at the Elementary Particle Theory Group of the University of Manchester, United Kingdom. **Nov. 1, 2014 to Aug. 6, 2017** .
with Prof. Mike Seymour and Dr. Mrinal Dasgupta.
- **Postdoctoral Research associate: affiliated theorist of the CMS experiment**
2-year position at DESY Hamburg, **Oct 1 2012 - Oct 31 2014**, Hamburg Germany
with: Dr. Katerina Lipka (CMS group at DESY Hamburg), Prof. Sven-Olaf Moch (DESY Hamburg and University of Hamburg).
- **Postdoctoral Research associate**, 3-year position at Southern Methodist University
Sep 1 2009 - Aug 31 2012 , Dallas, USA.
With: Prof. Pavel Nadolsky.
- **INFN Research Fellow**: 2-year position at INFN and Salento U. **Mar 1 2007 - Feb 28 2009**,
Lecce, Italy.
With: Prof. Claudio Corianò.

Visiting positions

- **Short-Term Visit. Invited** at the University of Crete, Greece. **3 weeks, March 2005**. Collaboration with Prof. Theodor Tomaras
- **Short-Term Visit. Invited** at the University of Yoannina, Greece. **1 week, November 2005**. Collaboration with Prof. Kyriakos Tamvakis
- **Short-Term Visit. Invited** at the University of Liverpool UK, on Royal Society funds **Oct 14 2007 - Nov 2 2007**. Collaboration with Prof. Alon Faraggi
- **Short-Term Visit. Invited** at the University of “Tor Vergata” Rome **Nov 26 - 30, 2007**. Collaboration with the String theory group, Prof. F. Fucito.
- **Short-Term Visit. Invited** at the University of Liverpool UK, on Royal Society funds **Jan 27 2008 - Feb 15 2008**. Collaboration with Prof. Alon Faraggi
- **Short-Term Visit. Invited** at the University of “Tor Vergata” Rome **April 17 - 24, 2008**. Collaboration with the String theory group, Prof. F. Fucito.
- **Short-Term Visit Invited** at the State University of New York at Stony Brook, NY USA. **April 10-15 2012**. Invited by Prof. John Hobbs, leader of the group performing the measurements of the mass of the W vector boson, (D0 experimental collaboration, Tevatron).
- **Short-Term Visit. Invited** as the “**Theorist of the week**”, **23-30 April 2012**, “**Physics of the Terascale**”, DESY Hamburg 04/24 and DESY Zeuthen 04/25.
DESY’s “**Theorist of the week**” program brings a prominent theorist from around the globe to spend a week at the lab’s analysis center in Hamburg, Germany.
- **Short-Term Visit. Invited** at Southern Methodist University, Dallas, TX, USA. **Feb 16 - March 10, 2014**. Collaboration with Prof. Pavel Nadolsky and the CTEQ group.
- **Short-Term Visit. Invited** at Southern Methodist University, Dallas, TX, USA. **April 20 - May 8, 2015**. Collaboration with Prof. Pavel Nadolsky and the CTEQ group.
- **Short-Term Visit.** DESY Hamburg, Germany.
8-14 July, 2016. Collaboration with Prof. S.-O. Moch and Dr. K. Lipka (CMS Collaboration)

- **Short-Term Visit. Invited** at the Erwin Schrödinger International Institute for Mathematical Physics (ESI), Vienna, Austria.
24-29 July, 2016. “Challenges and Concepts for Field Theory and Applications in the Era of LHC Run-2”.
- **Short-Term Visit. Invited** at University of Salento & INFN sez. Lecce, Lecce, Italy.
June 21 - Aug 7, 2018. Collaboration with Prof. Claudio Corianò and the Lecce HEP Theory group.

International Conferences and Talks

Plenary Talks

- Talk given at: “The International Workshop on Transverse Polarisation Phenomena in Hard Processes” (Transversity 2005), Villa Olmo Como, Sep. 7-10 2005.
- Talk given at the “MCWS”, II Monte Carlo Workshop, Physics and Simulations at the LHC. INFN Frascati National Laboratories, Italy May 22-23 2006.
- **Invited Speaker** at the “Brainstorming and Calculation Shop on the Low Energy Frontier” workshop. DESY, Theory Group, Notkestrasse 85, Hamburg, Germany, 11-14 June 2008.
- Talk given at the “CTEQ Meeting” workshop. Nov. 13, 2009, Northwestern University, Evanston, IL 60208, USA.
- Talk given at the “U.S. ATLAS Analysis Jamboree: UTA” workshop. University of Texas at Arlington, Arlington TX, USA, May 17-19, 2010.
- **Invited Speaker**, talk given at the “Winter Workshop on Recent QCD Advances at the LHC” workshop. Les Houches, France, February 13-18, 2011.
- Talk given at the “QCD Evolution Workshop 2012” conference. May 14 - 17, 2012 Thomas Jefferson National Accelerator Facility Newport News, VA, USA.
- **Invited Speaker** at the “Flavor Structure of the Nucleon Sea” conference, European Center for Theoretical Physics, ECT*, July 1-5, 2013 Villazzano, Trento, Italy.
- **Invited Speaker** at the “Terascale Working-group Meeting: Semi-inclusive QCD Processes at the LHC” workshop. October 27-29 2013 Liebenberg (Berlin), Germany.
- **Invited Speaker** at the “Physics at the Terascale” conference. Dec 2-4 2013 KIT, Karlsruhe, Germany.
- **Invited Speaker** at the “Studies of 3D structure of nucleon” conference. Feb 24-28, 2014 Institute for Nuclear Theory (INT), Seattle, USA.
- **Invited Speaker** at the “QCD@Work 2014, International Workshop on QCD, theory and experiment” workshop. 16-19 June 2014, Giovinazzo, (Bari), Italy.
- Talk given at the “PDF@CMS” workshop. CERN, Geneva July 17 2014.
- Talk given at the “Top Quark PAG Meeting” CERN, Geneva Aug 5 2014. Discussion with the experimental group involved in top-quark related analyses at the LHC CMS experiment.
- Talk given at the “Proton Structure in the LHC Era - School and Workshop”, Sep. 29 - Oct. 2 2014, DESY, Hamburg, Germany. Determination of Parton Distribution function of the proton with the DIFFTOP code.

- **Invited Speaker** at the “TOP LHC Working Group meeting”. Talk: “Phenomenology of top-quark pair production at the LHC: studies with DIFFTOP”, 12 - 13 January 2015, CERN Geneva.
- **Plenary Summary Talk** for the Heavy-flavor session of DIS2015 conference. “DIS2015 XXIII International Workshop on Deep-Inelastic Scattering and Related Subjects”, April 27 to May 1 2015, Southern Methodist University, Dallas, TX, USA.
- **Invited Speaker** at the “XLV International Symposium on Multiparticle Dynamics”. Talk: “Parton distribution functions and the structure of the proton: the CT14 QCD global analysis”, 4-9 October 2015, Wildbad Kreuth, Germany.
- **Invited Speaker** at the “From 1D Fragmentation towards 3D Correlated Fragmentation” conference. Talk: “Non-perturbative TMD parameters and the p_T spectra of electroweak bosons”, 26-30 October 2015, ECT* (European Center for Theoretical Physics), Trento, Italy.
- **Invited Speaker** at the “QCD@work2016” conference. Talk: “Recent developments in QCD global analyses of PDFs of the proton”, on behalf of the CTEQ collaboration. 27-30 June 2016, Martina Franca, Italy.
- **Invited Speaker** at the “PSR2016, Parton Showers, Event Generators and Resummation” conference. Talk: “Threshold expansions and applications to differential top-quark pair production at the LHC: exploratory PDF analyses”. 4-6 July 2016, “Universite Pierre et Marie Curie” (UPMC), Paris, France.
- **Invited Speaker** at the “Epiphany 2017: Particle Theory meets first data from LHC run II” conference. Talk: “Impact of the HERA I+II combined data on the CT14 QCD global analysis”. 9-12 January 2017, “H. Niewodniczanski Institute of Nuclear Physics PAN”, Krakow, Poland.
- Talk given at the “Lancaster-Manchester-Sheffield Consortium for Fundamental Physics” meeting. Talk: “LHC precision challenges: structure of the proton, substructure of jets”. University of Sheffield, Hicks Building, Lecture Theatre E, Sheffield, United Kingdom, Jun. 20, 2017
- **Invited Speaker** at the “QCD@Work International Workshop on QCD Theory and Experiment”. Talk: “Parton Distribution Functions with Intrinsic Charm and Other News from CTEQ”. 25-28 June 2018, “Ex Ospedale di San Rocco”, Matera, Italy.
- Talk given at the “BOOST2018 - 10th Conference on boosted objects” Talk: “Top taggers: an analytical perspective”. “Universite Pierre et Marie Curie” (UPMC), Paris, France, July 16-20, 2018

Parallel sessions

- Talk given at the “QCD@work 2007” workshop. International Workshop on Quantum Chromodynamics, Theory and Experiment. June 16-20 2007, Martina Franca (TA), Italy.
- **Invited speaker** for a talk given at the “I.F.A.E. (Incontri di Fisica delle alte Energie)” conference, Ex Convento di S. Cristina, Piazzetta G. Morandi 2, Bologna, Italy, 26-28 Mar 2008.
- Talk given at the “IFAE 2009 (Incontri di Fisica delle Alte Energie 2009)” conference, Bari, Italy, 15-17 Apr 2009.
- Talk given at the “DIS2010 XVIII International Workshop on Deep-Inelastic Scattering and Related Subjects” conference. Convitto della Calza, Firenze, Italy, 19th - 23th April 2010.
- Talk given at the “Pheno 2010 Symposium” conference. University of Wisconsin, Madison, USA. 10-12 May, 2010

- Talk given at the “DIS2011 XIX International Workshop on Deep-Inelastic Scattering and Related Subjects” conference. Newport News Marriott at City Center Newport News, VA, USA. April 11-15, 2011.
- Talk given at the “2011 Fall Joint Meeting Texas Section of **American Physical Society (APS)**” conference. October 06-08, 2011. Department of Physics and Astronomy Texas A& M University-Commerce, Commerce, TX, USA.
- Talk given at the “DIS2013 XXI International Workshop on Deep-Inelastic Scattering and Related Subjects” conference. Conference Centre of Marseilles, Provence, France. April 22th to 26th, 2013.
- Talk given at the “DIS2014 XXII International Workshop on Deep-Inelastic Scattering and Related Subjects” conference. University of Warsaw, Warsaw, Poland. April 28 to May 2 2014.
- **Invited speaker** at the “37th International conference on High energy Physics ICHEP 2014” conference. Valencia Conference Centre, Valencia, Spain. July 2-9, 2014.
- Talk given at the “DIS2017 XXV International Workshop on Deep-Inelastic Scattering and Related Subjects” conference. University of Birmingham, Birmingham, United Kingdom. April 3-7 2017.
- Talk given at “CIPANP2018, Thirteenth Conference on the Intersections of Particle and Nuclear Physics”. Hyatt Regency Indian Wells, Palm Springs, CA, USA. May 28 - June 3 2018

Seminars

- “*Beyond the Standard Model physics at Hadron Colliders: constraints from QCD global analyses.*” “String Phenomenology Group Seminars”, University of Liverpool, Liverpool, UK. March 10, 2015.
- “*Top-quark pair production phenomenology at hadron colliders*”, “Liverpool High Energy Theory Divisional Seminars”, University of Liverpool, Liverpool, UK. March 11, 2015.
- “*News on top-quark pair production differential cross section: Phenomenological applications in QCD with the DiffTop code*”. Departmental seminar, Southern Methodist University, Dallas, TX, USA. May 6, 2015.
- “*Proton Structure and Hadron Collider Phenomenology: SM craters and BSM Physics*”. Seminar at the Experimental Particle Physics department University of Liverpool, Liverpool, UK. Nov 18, 2015
- “*Developments in the parton distribution functions of the proton and phenomenological applications at hadron colliders*” “Bohr Lunch Seminar University of Manchester”. Manchester UK. October 31, 2014.
- “*Top-quark production at the LHC: differential cross section and phenomenological applications*”. Departmental seminar, Southern Methodist University, Dallas, TX, USA. March 3, 2014.
- “*Heavy-flavor treatment at NNLO in CTEQ PDF analysis*”. DESY-Hamburg, April 24, 2012. **“Theorist of the Week”**
- “*Heavy-flavor treatment at NNLO in CTEQ PDF analysis*”. DESY-Zeuthen, April 25, 2012.
- “*Anomalous Extension of the Standard Model: Unitarity bounds on the D-brane models*”. Theoretical Physics Division, University of Liverpool, Liverpool UK. February 5, 2008.
- “*Z’ Searches at the LHC: Some QCD Precision Studies*”. Dept. of Physics University of Liverpool, Liverpool UK. January 31, 2008.
- “*Z’ Searches at the LHC*”. Theoretical Physics Division, University of Liverpool, Liverpool UK. October 16, 2007.

Teaching experience

Co-Supervision

Co-supervisor of the Master Thesis work of:

- Dr Roberta Armillis, “*Neutral current analyses in extensions of the Standard Model*”, 2006-2007.
- Dr Antonio Mariano, “*Extensions of the Next-to-Minimal Supersymmetric Standard Model*”, 2007-2008.

Mentor

The students I have mentored during the preparation of their Master thesis are:

- Dr Giovanni Antonio Chirilli, (Ph.D. Old Dominion University),
- Dr Emanuela Dimastrogiovanni, (Ph.D. University of Padua),
- Dr Simone Morelli (Ph.D. - Univ. of Salento),
- Dr Elisa Manno (Ph.D. - Univ. of Liverpool).

Teaching at Salento U. 2007/2008

Teaching activity for graduate students of the theory group.

- 1-month course on “Spontaneous Symmetry Breaking and the Higgs Mechanism”,
- 1-month course on 1-loop calculations “A Higgs decay at 1-loop: $H \rightarrow \gamma\gamma$ ”.

Teaching duties at Manchester University 2014/2015 - 2015/2016

Teaching assistant (2 hours a week of teaching during term time). Tutoring two groups of five undergraduate students in second year BSc at the School of Physics and Astronomy.

Physics core courses: Introduction to Quantum Mechanics, Electromagnetism, Mathematics of Waves and Fields, Wave Optics, Solid State Physics, Thermal and Statistical Physics.

Summer Project supervision

Mr Paolo Pichini: “The content of the proton”, The University of Manchester, UK. June 2016 - July 2016.

Lecturing

I functioned as a substitute lecturer and have given lectures and example classes on Lagrangian Dynamics and Advanced Dynamics in front of 200 1- and 2-year students at the University of Manchester. The Lectures were well received.

Teaching duties at Kennesaw State University 2017 -2019

Fall 2017, Aug - Dec 2017, PHYS2211: “Principles of Physics I”, 7 contact hours per week

Spring 2018, Jan - May 2018, PHYS2211: “Principles of Physics I”, 7 contact hours per week

Fall 2018, Aug - Dec 2018, PHYS3710: “Modern Physics”, PHYS1111L: “Introductory Physics Laboratory I”, and PHYS2211L: “Principles of Physics I Laboratory”.

Spring 2019, Jan - May 2019, PHYS2211: “Principles of Physics I”. **Fall 2019, Aug - Dec 2019**, PHYS3710: “Modern Physics”, and PHYS2212L: “Principles of Physics II Laboratory”.

Internship project - University Affiliated activity

Mr Andrew McEntaggart: “Elementary Particle Theory and the Physics of the LHC”, Feb 1 - June 7 2019.