Riccardo **Longo**

Postdoctoral Research Fellow at the University of Illinois

Via della Repubblica 11, Fubine (AL), 15043, Italy

+39 348 1634728 | riccardo.longo@cern.ch | riclongo | rlongo | riccardo.longo_phy

Personal Information

- Gender: Male
- Citizenship: Italian
- Place of birth: Turin, Italy
- Date of birth: 21/03/1990
- Civil status: Single
- Address (work): CERN, F-01631 CERN Cedex France, Building 892 - Office 1-D06

University Education

University of Illinois at Urbana Champaign

Urbana, Illinois, USA (currently dislocated at CERN)

Postdoctoral Research Fellow — *March 2018 - Now*

- Supervisors: Prof. Matthias Grosse-Perdekamp, mgp@illinois.edu, Dr. Caroline Riedl, criedl@illinois.edu
- Main tasks: Responsible for the COMPASS data and Monte Carlo production on the Blue Waters Supercomputer. Work with graduate students from UIUC and collaborating institutions. Work on the data analysis of the COMPASS Drell-Yan data sets and support to the UIUC detectors DC5 and Straw 3 during data-taking operations at CERN.

University of Turin

Turin, Italy

PhD in Physics and Astrophysics — *Nov. 2014 - March 2014*

- Title of the Thesis: Measurement of spin effects in the Drell-Yan process at the COMPASS experiment
- Team Leader: Prof. Daniele Panzieri, panzieri@to.infn.it
- Supervisors: Dr. Michela Chiosso, chiosso@to.infn.it, Dr. Bakur Parsamyan, bakur@cern.ch
- Thesis submitted in March 2018 and defended successfully on 4th May 2018. PhD granted with honors (cum laude).

University of Turin

Turin, Italy

Master's Degree in Nuclear and Sub-nuclear Physics — *Sept. 2012 - Jul. 2014*

- Master Thesis: The Sivers Asymmetry in Drell-Yan processes at COMPASS: study of the experimental apparatus and of different extraction methods
- Final mark: 110/110 cum laude and honorable mention
- Supervisors: Prof. Daniele Panzieri, panzieri@to.infn.it, Dr. Michela Chiosso, chiosso@to.infn.it

University of Eastern Piedmont

Alessandria, Italy

Bachelor's Degree in Mathematics and Physics — *Sept. 2009 - Jul. 2012*

- Bachelor Thesis: Study of the acceptance of the new Large Area Trackers at the COMPASS-II experiment at CERN
- Final mark: 110/110 cum laudae
- Supervisors: Prof. Daniele Panzieri, panzieri@to.infn.it, Dr. Stefano Takekawa

Main research activities and responsibilities

COMPASS Experiment at CERN (2013 - Now)

Since 2013 I have been working at the COMPASS experiment at CERN. COMPASS is a fixed-target high energy physics experiment located in the north area of the SPS (M2 beam line). The experiment is in operation since 2002 and covers a broad range of physics aspects in the field of hadron structure and spectroscopy. An important part of the experimental programme is the exploration of the transverse spin structure of the nucleon via measurement of spin (in)dependent azimuthal asymmetries arising in semi-inclusive deep inelastic scattering (SIDIS) and in Drell-Yan (DY) cross-sections. My research interests during PhD were mainly focused on the study of aforementioned spin phenomena and analysis of experimental data collected by the COMPASS experiment. In particular, I have been working on the following tasks:

- Simulations (FLUKA) to estimate the radiation dose and radiation damage in the polarized target region for 2015 Drell-Yan run. Designing the optimal configuration of the radiation shielding.
- Study of asymmetry-extraction methods applied in COMPASS-SIDIS analyses and their optimization for the DY-case.
- Reference person for the "express" analysis of COMPASS Drell-Yan data (August-September, 2015).
- Maintenance and operation of COMPASS MWPC and Rich Wall detectors during 2015-2017 runs (1 month/year on-call periods).
- Reference person for the maintenance and development of the Drell-Yan branch of TGeant (Geant4-based Monte-Carlo simulation tool for the COMPASS setup).

- Analysis of COMPASS polarized DY data collected in 2015 and extraction of DY transverse-spin-dependent azimuthal asymmetries (TSAs). Study and estimation of systematic effects, interpretation of obtained physics results. Final results on TSAs were released by the COMPASS collaboration in March 2017 and recently published in PRL.119 (2017) no.11,112002.
- Extraction and analysis of DY q_T-weighted TSAs. Obtained results were released by the COMPASS collaboration in July 2017.
- Study of unpolarized Drell-Yan asymmetries from COMPASS data and Lam-Tung sum rule violation.
- Preparation of Monte-Carlo branches and simulations for the "COMPASS-future" programmes.

Teaching Activities

Teaching Assistant, course of Fundamentals of Physics — *Novara, Italy*

University of Eastern Piedmont, Medicine Department — *Nov. 2014 - Now*

- Undergraduate Degree in Biotechnology
- Lecturer: Prof. Daniele Panzieri

Teaching Assistant, course of Physics I — *Alessandria, Italy*

University of Eastern Piedmont, Department of Science, Innovation and Technology — *Nov. 2014 - Now*

- Undergraduate Degree in Chemistry
- Lecturer: Prof. Daniele Panzieri

Teaching Assistant, course of Physics — *Turin, Italy*

University of Turin, Department of Chemistry — *Sep. 2016 - Now*

- Undergraduate Degree in Chemistry and Chemical Technologies
- Lecturer: Prof. Mariaelena Boglione

Tutor, course of Mechanics — *Turin, Italy*

University of Turin, Department of Physics — *Jan. 2016 - May.2016*

- Undergraduate Degree in Physics
- Lecturer: Prof. Ezio Menichetti

Skills

Professional Skills and Competences

- High Energy Physics, Experimental Physics, Spin Physics
- Monte Carlo techniques
- Data analysis and Statistical analysis
- Excellent communication and technical skills

Computing Skills

- Windows, MAC OS and LINUX operating systems
- Computing farms (batch systems: pbs, lsf, htcondor, Blue Waters), cloud computing
- C/C++/C++11, Python, FORTRAN and shell scripting
- Geant4 and FLUKA transport codes
- Root package, Monte Carlo tools and generators (Pythia 6, Pythia8)
- LHAPDF interface to PDF sets
- COMPASS software tools (PHAST, TGeant, CORAL)

Languages

- Italian (Native, proficiency)
- English (Professional working proficiency)

Honors & Awards

2017	**Prize "Carlo Castagnoli"**, awarded by the Italian Physical Society to young physicists who have distinguished themselves in their studies and research activities.	*Trento, Italy*
2016	**"Menzione speciale" for the talk "Highlights from COMPASS SIDIS and Drell-Yan programmes"**, awarded by Section I of the Scientific Committee of the 102° Congress of the Italian Physical Society	*Padova, Italy*
2013	**Best Bachelor's student of the Department of Science, Innovation and Technology of the University of the Eastern Piedmont**, awarded by University of Eastern Piedmont.	*Vercelli, Italy*

Conferences and Schools

Talks at Conferences

15th International Workshop on Hadron Structure and Spectroscopy — *Bonn, Germany*

Title: "Recent polarized Drell-Yan results from COMPASS" (invited) — *19 - 21 Mar. 2018*

103° Congress of the Italian Physical Society — *Trento, Italy*

Title: "Polarized Drell-Yan measurements at COMPASS" — *11 - 15 Sep. 2017*

Excited QCD Conference 2017 — *Sintra, Portugal*

Title: "Polarized Drell-Yan measurements at COMPASS" — *7 - 13 May 2017*

102° Congress of the Italian Physical Society — *Padova, Italy*

Title: "Highlights from COMPASS SIDIS and Drell-Yan programmes" — *26 - 30 Sep. 2016*

XII Confinement Conference — *Thessaloniki, Greece*

Title: "Polarized Drell-Yan at COMPASS" — *28 Aug. - 3 Sep. 2016*

Spin Praha 2015 — *Praha, Czech Republic*

Title: "COMPASS Drell-Yan Programme" — *26-31 Jul. 2015*

International Conference of Physics Students 2014 — *Heidelberg, Germany*

Title: "The proton 3D structure" — *10-17 Aug. 2014*

Organization of Conferences

International Conference of Physics Students 2017 — *Turin, Italy*

Italian Association of Physics Students and International Association of Physics Students — *7 - 14 Aug. 2017*

- Vice-Chair and Local Coordinator of the Organizing Committee
- 450 participants from 44 countries around the world
- Conference budget: 170 k€. More than 90 k€ resulting from financing agreements with research institutes and banking foundations
- www.icps2017.it

XIV International Workshop on Hadron Structure and Spectroscopy — *Cortona, Italy*

INFN Turin and University of Turin — *2 - 5 April 2017*

- Member of the Organizing Committee
- 92 participants
- http://iwhss17.to.infn.it

II Italian Conference of Physics Students — *Turin, Italy*

Italian Association of Physics Students — *22 - 24 April 2016*

- Chair of the Organizing Committee
- 130 participants
- http://www.ai-sf.it/cisf2016/

I Italian Conference of Physics Students — *Turin, Italy*

Italian Association of Physics Students — *15 - 17 May 2015*

- Member of the Organizing Committee
- 90 participants
- http://www.ai-sf.it/cisf/

Schools

IV International Geant4 School — *Beograd, Serbia*

Vinca Institute of Nuclear Science — *23-28 Oct. 2016*

International School of Nuclear Physics, 37th Course, Probing Hadron Structure with Lepton and Hadron Beams — *Erice, Italy*

Ettore Majorana Center for Scientific Culture — *16-24 Sep. 2015*

Frontiers in Nuclear and Hadronic Physics — *Firenze, Italy*

Galileo Galilei Institute — *22-28 Feb. 2015*

Summer Student Program — *Geneva, Switzerland*

European Center for Nuclear Research, CERN — *Jul. 2013 - Sep.2013*

- FLUKA simulation of the irradiation dose on the COMPASS Polarized Target material holder
- Study of the energy loss suffered by Drell-Yan dimuon pairs in the COMPASS hadron absorber
- Supervisor: Dr. Angelo Maggiora

Publications

"First measurement of transverse-spin-dependent azimuthal asymmetries in the Drell-Yan process" — *Phys. Rev. Lett.* **119** *(2017) n°.11,112002*

M. Aghasyan *et al.* [COMPASS Collaboration] — *[arXiv:1704.00488 [hep-ex]]*

"Sivers asymmetry extracted in SIDIS at the hard scales of the Drell-Yan process at COMPASS" — *Phys. Lett. B* **770** *(2017) 138*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1609.07374 [hep-ex]]*

"Polarized Drell-Yan measurements at COMPASS" — *Acta Phys.Polon.Supp. 10 (2017) no.4, 1119-1124*

R. Longo [COMPASS Collaboration]

"Highlights from COMPASS SIDIS and Drell-Yan programmes" — *Nuovo Cim. C* **40** *(2017) no.2, 88.*

R. Longo [COMPASS Collaboration]

"Polarised Drell-Yan at COMPASS" — *EPJ Web Conf.* **137** *(2017) 05013*

R. Longo [COMPASS Collaboration]

"First measurement of the Sivers asymmetry for gluons using SIDIS data" — *Phys. Lett. B* **772** *(2017) 854*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1701.02453 [hep-ex]]*

"Final COMPASS results on the deuteron spin-dependent structure function g_1^{d} and the Bjorken sum rule" — *Phys. Lett. B* **769** *(2017) 34*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1612.00620 [hep-ex]]*

"Multiplicities of charged kaons from deep-inelastic muon scattering off an isoscalar target" — *Phys. Lett. B* **767** *(2017) 133*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1608.06760 [hep-ex]]*

"Exclusive ω meson muoproduction on transversely polarised protons" — *Nucl. Phys. B* **915** *(2017) 454*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1606.03725 [hep-ex]]*

"Multiplicities of charged pions and charged hadrons from deep-inelastic scattering of muons off an isoscalar target" — *Phys. Lett. B* **764** *(2017) 1*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1604.02695 [hep-ex]]*

"Leading-order determination of the gluon polarisation from semi-inclusive deep inelastic scattering data" — *Eur. Phys. J. C* **77** *(2017) no.4, 209*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1512.05053 [hep-ex]]*

"Longitudinal double spin asymmetries in single hadron quasi-real photoproduction at high p_T" — *Phys. Lett. B* **753** *(2016) 573*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1509.03526 [hep-ex]]*

"Resonance Production and $\pi\pi$ S-wave in $\pi^- + p \to \pi^-\pi^-\pi^+ + p_{recoil}$ at 190 GeV/c" — *Phys. Rev. D* **95** *(2017) no.3, 032004*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1509.00992 [hep-ex]]*

"Interplay among transversity induced asymmetries in hadron leptoproduction" — *Phys. Lett. B* **753** *(2016) 406*

C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1507.07593 [hep-ex]]*

"The spin structure function g_1^p of the proton and a test of the Bjorken sum rule" — *Phys. Lett. B* **753** *(2016) 18*
C. Adolph *et al.* [COMPASS Collaboration] — *[arXiv:1503.08935 [hep-ex]]*

"Longitudinal double-spin asymmetry A_1^p and spin-dependent structure function g_1^p of the proton at small values of x and Q^2" — *Phys.Lett. B781 (2018) 464-472*
M. Aghasyan *et al.* [COMPASS Collaboration] — *arXiv:1710.01014 [hep-ex]*

"New analysis of $\eta\pi$ tensor resonances measured at the COMPASS experiment" — *Phys.Lett. B779 (2018) 464-472*
A. Jackura *et al.* [COMPASS Collaboration] — *arXiv:1707.02848 [hep-ph]*

"Transverse-momentum-dependent Multiplicities of Charged Hadrons in Muon-Deuteron Deep Inelastic Scattering" — *Phys.Rev. D97 (2018) no.3, 032006*
M. Aghasyan *et al.* [COMPASS Collaboration] — *arXiv:1709.07374 [hep-ex]*

"Azimuthal asymmetries of charged hadrons produced in high-energy muon scattering off longitudinally polarised deuterons" — *Submitted to EPJC*
C. Adolph *et al.* [COMPASS Collaboration] — *arXiv:1609.06062 [hep-ex]*

"Observation of $X(3872)$ muoproduction at COMPASS" — *Submitted to Phys. Lett. B*
M. Aghasyan *et al.* [COMPASS Collaboration] — *arXiv:1707.01796 [hep-ex]*

"K^- over K^+ multiplicity ratio for kaons produced in DIS with a large fraction of the virtual-photon energy" — *Submitted to Phys. Lett. B*
R. Akhunzyanov *et al.* [COMPASS Collaboration] — *arXiv:1802.00584*

"Transverse Extension of Partons in the Proton probed by Deeply Virtual Compton Scattering" — *Submitted to Phys. Lett. B*
R. Akhunzyanov *et al.* [COMPASS Collaboration] — *arXiv:1802.02739*

"Light isovector resonances in $\pi^- p \to \pi^-\pi^-\pi^+ p$ at 190 GeV/c" — *Submitted to Phys. Rev. D*
R. Akhunzyanov *et al.* [COMPASS Collaboration] — *arXiv:1802.05913*

Memberships

Italian National Institute for Nuclear Physics (Istituto Nazionale di Fisica Nucleare - INFN) — *Turin, Italy*
Associate member — *Jun. 2013 - Now*

European Center for Nuclear Research (CERN) — *Geneva, Switzerland*
User — *Jun. 2013 - Now*

COMPASS Collaboration — *Geneva, Switzerland*
Member — *Jun. 2013 - Now*

Italian Physical Society (Società Italiana di Fisica - SIF) — *Bologna, Italy*
Member — *May 2016 - Now*

Italian Association of Physics Students (Associazione Italiana Studenti di Fisica - AISF) — *Turin, Italy*
Member — *Aug 2014 - Now*

Extracurricular Activity

Italian Association of Physics Students — *Turin, Italy*
Founding Partner — *Aug. 2014*

- Built up, in three years, the biggest network ever for physics students in Italy, counting nowadays more than 1000 members
- Several national and international events organized to promote the networking among young physicist from different countries and regions

Italian Association of Physics Student, Local Committee of Turin *Turin, Italy*

Founder and President *Jun. 2015 - Jul. 2016*

- Organization of the First and the Second national meeting of Italian Physics Students in Turin
- Several agreements reached with local research institutions to raise funds for AISF events in Turin