Andrea Giammanco

PERSONAL INFORMATION

Date of birth: 17/03/1976

Nationality: Italian

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Web site at CERN: http://cern.ch/andrea.giammanco

Web site at CP3 (UCLouvain): http://cp3.irmp.ucl.ac.be/Members/giammanco

InspireHEP profile: http://inspirehep.net/author/profile/A.Giammanco.1

Google Scholar profile: https://scholar.google.ch/citations?user=Mn3zVmMAAAAJ&hl=en

- **EDUCATION**

2003 PhD in Physics
Scuola Normale Superiore, Pisa, Italy
Thesis Advisor: Lorenzo Foà

1999 Master (*Laurea*) in Physics, final mark: 110/110 *magna cum laude*
University of Catania, Italy

- **CURRENT POSITION**

2023 – *Directeur de Recherche* (Research Director)
Fonds National de la Recherche Scientifique (FNRS), Belgium
/ Centre for Cosmology, Particle Physics and Phenomenology (CP3), Université catholique de Louvain (UCLouvain), Louvain-la-Neuve, Belgium

- **PREVIOUS POSITIONS**

2019 – 2023 *Maître de Recherche* (Senior Researcher – unlimited duration contract)
FNRS (Belgium) / CP3 @ UCLouvain (Belgium)

2011 – 2019 *Chercheur Qualifié* (Researcher – unlimited duration contract)
FNRS (Belgium) / CP3 @ UCLouvain (Belgium)

2011 – 2015 Mobilitas Top Researcher (20% full-time equivalent, in overlap with FNRS appointment)
European Social Fund via the Estonian Science Foundation
NICPB, Tallinn, Estonia / based at CERN

2007 – 2011 *Chargé de Recherche* (Researcher – limited duration contract)
FNRS (Belgium) / CP3 @ UCLouvain (Belgium)

- **FELLOWSHIPS**

2005 – 2007 Post-doctoral fellowship, CP3 @ UCLouvain, Belgium

2004 – 2005 Post-doctoral fellowship, Scuola Normale Superiore, Pisa, Italy

2003 "Della Riccia" 12-month scholarship, CERN, Geneva, Switzerland

2000 – 2002 Doctoral scholarship, Scuola Normale Superiore, Pisa, Italy

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

2011 – 10 Postdocs (6 ongoing, *3 are now PIs*) / 12 PhD students (4 ongoing) / 1 MSc student
CP3 @ UCLouvain

2011 – 2015 2 Postdocs / 1 PhD student / 1 MSc student
NICPB, Tallinn, Estonia & University of Tartu, Estonia

2012 – 2013 2 Technical Students (i.e. PhD students in Computer Science)
CERN, Geneva, Switzerland

2010 – 2013 8 Summer Students (i.e. 3-month interns)
CERN, Geneva, Switzerland

I am proud of the achievements of my former supervisees, including but not limited to:

- Joosep Pata (MSc student 2013-2014): 1st "CMS Fundamental Physics Scholarship" (2014), "CMS PhD Thesis Award" (2019), now permanent staff at NICPB Tallinn (Estonia)
- Georgios Krintiras (PhD student 2015-2019): "CMS Achievement Award" 2022, convener of the CMS Luminosity group (2019-2021) and of the CMS Heavy Ions group (2022-2024)
- Pieter David (postdoc 2016-2021): "CMS Achievement Award" 2021
- Abideh Jafari (postdoc 2014-2017): convener of the CMS Top Quark group (2019-2021), PI at

DESY (Germany) with a Helmholtz Young Investigator grant, and Professor at Isfahan U. (Iran)
- Hamed Bakhshiansohi (postdoc 2016-2018): Professor at Isfahan U. (Iran)
- Raveendrababu Karnam (postdoc 2020-2022): permanent staff member at NISER (India)
- Anna Benecke (postdoc 2021-…): convener of the CMS Jets & Missing Energy group (2023-2025); "CMS Achievement Award" 2023

- **ORGANISATION OF SCIENTIFIC MEETINGS**

2025 5th European Workshop on Maritime Systems Resilience and Security**,** MARESEC 2025 / program committee / Rostock, Germany
2025 5th MODE workshop / organizer / Kolymbari, Greece
2024 4th European Workshop on Maritime Systems Resilience and Security**,** MARESEC 2024 (including a special session on muography) / program committee / Bremen, Germany
2023 Muographers'23 workshop / international advisory committee / Naples, Italy
2022 2nd MODE workshop / organizer / Kolymbari, Greece
2021 Muographers'21 workshop / organizer / Ghent, Belgium
2021 1st MODE workshop / organizer / UCLouvain, Belgium
2021 Heavy Ions and New Physics workshop / organizer / ECTS* Trento, Italy (virtual)
2021 iWoRID, 22nd int. workshop on radiation imaging detectors / organizer / Ghent, Belgium
2019 BND Graduate School 2019 / chair of the organizing committee / Spa, Belgium
2019 IAEA Technical Meeting on Non-Destructive Testing Using Muon Radiography / scientific advisory committee member / IAEA, Vienna, Austria
2018 American Geophysical Union Fall Meeting / session convener / Washington, USA
2018 Heavy Ions and Hidden Sectors workshop / organizer / UCLouvain, Belgium
2018 Muographers'18 workshop / session convener / Tokyo, Japan
2017 DIS2017, Deep Inelastic Scattering workshop / session convener / Birmingham, UK
2016 LHCP2016, workshop on LHC physics / session convener / Lund, Sweden
2015 TOP2015, international workshop on top quark physics / international advisory committee member / Ischia, Italy
2014 2nd workshop on Fast Simulations in HEP / organizer / DESY, Zeuthen, Germany
2013 1st workshop on Fast Simulations in HEP / organizer / DESY, Zeuthen, Germany
2010 TOP2010, international workshop on top quark physics / organizer / Bruges, Belgium

- **INSTITUTIONAL RESPONSIBILITIES**

2023 – Deputy Team Leader / CMS-Louvain group / UCLouvain, Belgium & CERN
2022 – Management Committee of the CISM (Centre for High Performance Computing and Mass Storage) / UCLouvain, Belgium
2017 – Users Committee of the SMCS (Support in Methodology and Statistical Analysis) platform / UCLouvain, Belgium
2016 – Doctoral School Board / Faculty of Sciences / UCLouvain, Belgium
2023 – PhD equivalence commission (sub-set of the Doctoral School Board)
2014 – 2018 Organizer of the invited seminars in Particle Physics / CP3, UCLouvain, Belgium

- **COMMISSIONS OF TRUST**

2024 – CERN's Scientific Information Policy Board (SIPB), Geneva, Switzerland
2024 – Advisory Committee of CERN Users (ACCU), Geneva, Switzerland
2023 (Jan.-Aug.)[1] Editorial Board, Physica Scripta (IOP Publishing journal)
2022 – Jury PE9 (astrophysics, cosmology, instrumentation), FRIA doctoral grants, Belgium
2022 – Advisory Board, USERN, Iran
2020 – FNRS Doctoral Committee of Sciences, Belgium
2018 – FNRS Thematic Doctoral Committee "PandA" (Physics and Astrophysics), Belgium
2018 – 2023 Board of Directors of the "M.A.R.S. UCLouvain" not-for-profit organization, Belgium
2016 – 2021 CMS Thesis Award Committee / *chair* in 2019 and 2020
2016 – 2018 CMS Career Committee
2012 – 2014 CMS Publication Committee

Referee for the following journals: Appl. Sci. / Comput. Phys. Commun. / Earth Space Sci. / Eng. Appl. Artif. Intell. / Eur. Phys. J. C / Eur. Phys. J. Plus / Geosci. Instrum. Methods Data Syst. / IEEE Trans.

[1] Initially agreed to join for a 2-year term, I quit in Aug. 2023 due to their refusal to retract a problematic article: Leif Holmlid and Sindre Zeiner-Gundersen, Phys. Scr. 94 (2019) 075005

Nucl. Sci. / Instrum. / iScience / JAIS / JHEP / JINST / J. Appl. Phys. / J. Archaeol. Sci. Rep. / Mach. learn.: sci. technol. *("Outstanding Reviewer"* 2020 and 2022*)* / Nucl. Inst. Meth. A / Nucl. Phys. B / Nucl. Sci. Tech. / Phys. Lett. B *("Most Valuable Reviewer"* 2010*)* / Phys. Open / Phys. Scr. / Rev. Sci. Instrum. / Sci. Rep. / Symmetry.

Referee for institutional evaluations:

2021 VQR 2015-2019 (nation-wide evaluation of research quality), Italy
2014 Evaluation of a R&D unit in Portugal for the European Science Foundation

Referee for awards, grants and funding applications:

2016 & 2024 ERC Starting Grant
2024 University Research Fellowships, Royal Society, UK
2023 Outstanding Research Award, NSTC, Taiwan
2023 Israel Science Foundation, Israel
2023 UKRI Future Leaders Fellowships, UK
2023 National Centre of Science and Technology Evaluation (NCSTE), Kazakhstan
2022 Science Vanguard Research Program, Taiwan
2020 CLASP Security/Environment call, STFC, UK
2019 – 2023 Swiss National Science Foundation
2018 & 2021 PRIN (multi-institute research projects), Italy
2018 Rita Levi Montalcini programme (tenure-track positions), Italy
2017 & 2018 Czech Science Foundation

Consultant for the Particle Data Group in 2016.

Consultant for Deepsense (https://deepsense.network/), in matters related to muography, since 2024.

Jury member / reader: 32 PhDs in Belgium, China, Estonia, France, Germany, India, Iran, Italy, Spain, United Kingdom.

- **MAIN FUNDED PROJECTS**

Project Title	*Funding source*	*Amount (Euros)*	*Period*	*Giammanco's role*	*Research description of UCLouvain team*
MURAVES	FNRS & FWO	220,200 (*)	2025-2028	PI for UCLouvain	Data analysis and simulations in the MURAVES experiment
SilentBorder	H2020-RIA	404,000 (*)	2021-2025	PI for UCLouvain	ML reconstruction, simulations and detector optimization for muon tomography scanners at border controls
INTENSE	H2020-MSCA-RISE	64,400 (*)	2019-2024 (**)	Coordinator of WP "Muography"	Muography
Muography	FNRS	188,180	2019-2022	PI	Muography
Analysis Tools for Muon Radiography	FNRS	59,920	2021-2022	PI	Muography
CMS: Beyond the Standard Model	FNRS	1,430,200	2019-2024	Spokesperson	Data analysis in the CMS experiment

Be.h	EOS (FNRS + FWO)	1,085,500	2018-2022	Coordinator of WP "Higgs couplings"	Data analysis in the CMS experiment
AMVA4 NewPhysics	H2020-MSCA-ITN	No funding (*)	2015-2019	Deputy Coordinator	Advanced ML in HEP applications
Mobilitas Top Researcher Grant	European Social Fund (through Estonian Research Council)	479,000	2011-2015	PI	Top quark physics with CMS data
Trilateral mobility agreement UCLouvain-UL-AUB	Erasmus+	No funding apart from mobility	2020-2023	Coordinator of the mobility between UCLouvain, Université Libanaise (UL) and American University of Beirut (AUB)	CMS data analysis, muography

(*) This refers to the amount allocated to my team, not the whole budget of the project.
(**) Originally funded from beginning of 2019 to end of 2022, it has been suspended for 2 years during the COVID-19 global crisis, from May 2020 to April 2022, and extended by the corresponding duration.

- **RESEARCH TRACK RECORD**

Until end of 2016, I was 100% focused on high energy physics (HEP), mostly experimental studies in the ALEPH (2000-2003) and CMS (2003-present) collaborations plus some forays into phenomenology. Since end of 2016, I have been increasingly active in "muography", i.e. developing cosmic-ray μ detectors, simulations and data analysis methods for applications in other fields. Constant through most of my career, however, have been my interests in particle detector simulations and in applied statistics (most notably Machine Learning), two competences that are equally linked to both fundamental and applied physics.
Bibliometry (data from the Inspire database in January 2024):

	Papers	**Citations**	**h-index**
All authored	1330	>180,000	188
Papers with ≤10 authors	20	>3,200	9
Papers with ≤10 authors, including proceedings, white reports, and other non-peer reviewed literature	44	>3400	10
Only papers with crucial role	70	8160	30

Most of my papers are as member of the CMS experiment. Authorship of CMS papers is not automatic, but conditional upon fulfilment of service work, which I have been doing with continuity since I joined CMS in 2003. It is difficult to quantify the degree of impact of an individual to each paper in large collaborations. However, to facilitate a fair comparison with candidates from other sub-fields in the same panel, the table above also shows values restricted only to the papers (in CMS or not) where my role was uncontroversial, i.e. without my contribution those papers would not exist, or would look very different.

Coordination appointments:

- Main mandates in the CMS experiment at CERN:
  - Chair of the PhD Thesis Award Committee, Sep.2018-Aug.2020
  - Convener of the Top Quark Physics Analysis Group, Sep.2014-Aug.2016
  - Convener of the Simulations Group, Jan.2012-Dec.2013
  - Convener of the Fast Simulation Group, Jan.2011-Dec.2011
- In other multi-institute networks:
  - Member of the Steering Board of the *MODE* consortium (since 2020)
  - Coordinator of the Simulations working group of the *MURAVES* collaboration (since 2020)
  - Convener of work package *Muography* of *INTENSE* (2019-2023)
  - Convener of work package *Higgs Couplings* of Excellence of Science project *be.h* (2018-2020)

- Deputy Coordinator of the H2020-MSCA-ITN network *AMVA4NewPhysics* (2017-2019)

Patents:

- *Radiographic imaging based on detection of ionizing particles*, E. Cortina Gil, A. Giammanco, S. Basnet, S. Wuyckens. International Publication Number WO/2023/062027, 20/04/2023.
- *Magnetic field structure imaging apparatus and method using muons*, T. Kin, E. Cortina Gil, A. Giammanco. International Publication Number WO/2023/031265, 10/03/2023.

Books:

- *Muography: Exploring Earth's Subsurface with Elementary Particles* (ISBN: 9781119723028), in Wiley's Geophysical Monograph Series. Contributions: wrote RPC chapter; also, reviewer of 6 other chapters.
- *Muon Imaging: Present Status and Emerging Applications*, IAEA-TECDOC 2012. Contributions: main editor; also wrote introductory chapters and conclusions.

Software:

- *DELPHES* v3, released in 2013, quickly became the most used open-source code for parametric detector simulations in HEP. The corresponding article became the 3rd most cited experimental HEP paper in 2019.
- *TomOpt*, released publicly in 2024, is based on differentiable programming and aims at being an end-to-end optimization tool for particle detectors in muon tomography applications.

Prizes as best reviewer:

- 2020 and 2022, Machine learning: science and technology
- 2010, Physics Letters B