

STEFANO GIAGU

Curriculum Vitae

Rome
December 26th, 2021

Part I – General Information

Full Name	STEFANO GIAGU
Spoken Languages	Italiano, English, Français

Part II – Education

Type	Year	Institution	Notes
Laurea in Physics	1992	Sapienza Università di Roma	maximum grades and honours (cum laude) (110 e Lode)
PhD in Physics	1997	Sapienza Università di Roma	judgment: Ottimo (maximum grade)

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
20.12.2019	20.12.2028	MIUR	Qualified for the role of full Professor (Professore di Prima Fascia (SC: 02/A1)) in the call of “Abilitazione Scientifica Nazionale alle funzioni di Professore Universitario 2018/2020 (terzo quadrimestre)”
23.1.2014	20.12.2019	MIUR	Qualified for the role of full Professor (Professore di Prima Fascia (SC: 02/A1)) in the call of “Abilitazione Scientifica Nazionale alle funzioni di Professore Universitario 2012 (Decreto Direttoriale 222 del 20 Luglio 2012)”
1.11.2011	--	Sapienza Università di Roma	Associate Professor (Professore Seconda fascia) department of Physics
1.10.1999	30.10.2011	Sapienza Università di Roma	Assistant Professor (Ricercatore) department of Physics
1.3.2001	1.3.2004	DOE/URA (USA)	Visiting Scientist at Fermi National Laboratory
1.5.1997	1.5.1999	Istituto Nazionale Fisica Nucleare	post-doctoral fellow INFN Roma1
1.6.1993	1.3.1994	Istituto Nazionale Fisica Nucleare	post-MD fellow INFN Roma1

IIIB – Scientific Coordination Appointments

Start	End.	Institution/Experiment	Role
1.6.2021	--	ATLAS Experiment / INFN	National Coordinator of the ATLAS Italy Collaboration (Coordinatore Nazionale ATLAS Italia): a

1.7.2019	31.5.2021	ATLAS Experiment / INFN	community of ~400 active members and a budget of ~3 MEuro/year
1.7.2019	--	INFN	National Coordinator of the ATLAS Italy Collaboration (Coordinatore Nazionale ATLAS Italia): a community of ~400 active members and a budget of ~3 MEuro/year
1.6.2016	1.7.2019	INFN	Local Responsible for the INFN CSN5 group
2016	--	ATLAS Experiment	ML_INFN: for the development of an end-to-end approach to the use of Machine Learning for INFN research lines
2017	2018	DarkSide-20k experiment	Coordinatore Sezione Roma1 per la CSN1: a community of ~ 120 researchers and technicians
2013	2015	ATLAS Experiment	Theory hotspot for the ATLAS experiment
2017	2018	DarkSide-20k experiment	Member of the Management Board of the experiment
2015	2017	ATLAS Experiment	Member of the Publication Committee: supervision of all the publications of the ATLAS experiment (~2900 authors)
2010	2012	ATLAS Experiment	Coordinator of the Software and Science Simulation group: ~20 people
2009	2017	ATLAS Experiment	Coordinator of the Unconventional and exotic Higgs decays physics group: ~150 people
2010	2011	ATLAS Experiment	Physics Coordinator of the ATLAS-Italia collaboration: ~100 people
2009	2010	ATLAS Experiment	Coordinator of the Physics activities of the ATLAS-Rome group: ~36 people
2005	2007	CDF Experiment	Coordinator of the ATLAS Long-Lived Particles group: ~80 people
2000	2004	CDF Experiment	Coordinator of the ATLAS Physics Analysis Tools group: ~150 people
1995	1999	L3 Experiment	Physics Coordinator of the CDF-II B-Physics group: ~150 people
			Coordinator of the CDF-II Flavor Tagging and fully hadronic B decays groups: ~40 people
			Responsible of the SUSY processes Monte Carlo generator group

III C – Institutional Appointments

Start	End	Institution	Role
2019	--	Sapienza Università di Roma	Member of the Steering Committee for the new degree course (Laurea) in Artificial Intelligence at Sapienza University of Rome
2021	--	Sapienza Università di Roma	Coordinator of the InfoSapienza working group for Scientific High Performance Computing
2021	--	Sapienza Università di Roma	Member of the Committee Centro InfoSapienza
2018	2021	Sapienza Università di Roma	Member of the Committee Centro InfoSapienza
2014	2016	Sapienza Università di Roma	Member of the Giunta Facoltà Scienze Matematiche, Fisiche e Naturali

2012	--	Università di Siena	Member of the Consiglio di Dottorato Di Ricerca in Fisica Sperimentale
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IIID – Referee/Reviewer Appointments

Start	End	Institution	Role
2021	today	JHEP Journal	Reviewer
2020	2020	MIUR	Reviewer FISR2020 grants
2020	today	MDPI – Particles Journal	Member of the Editorial Board
2019	today	Elsevier – Pattern recognition Journal	Reviewer
2018	2019	INFN	Referee for Marie-Curie fellowship
2017	2017	MIUR	Referee Programma per Giovani Ricercatori “Rita Levi Montalcini”
2018	today	National Science Center, Poland	Reviewer for grant proposal (High Energy Physics Panel)
2016	today	European Physical Journal C - Springer	Reviewer
2016	today	Journal of Instrumentation - SISSA	Reviewer
2009	2011	SIF, Nuovo Cimento	Editorial Board member for the IFAE 2010
2016	2019	INFN	CSN1 Referee Experiment Belle-II
2016	today	INFN	CSN1 Referee Experiment KLOE-2
2014	today	INFN	CSN1 Referee Experiment PADME
2013	2013	MIUR	Referee progetti Futuro in Ricerca

Part IV – Teaching experience

- **supervisor of 20 PhD student thesis** in Physics (list provided at the end of this document)
- **supervisor of 57 Master-degree student thesis** in Physics (list provided at the end of this document)
- **supervisor of more than 60 Bachelor-degree thesis** in Physics
- supervisor of several post-doctoral students, CERN and INFN-DOE summer-students, FNAL summer-students in Physics

Year	Institution	Lecture/Course
2022	Sapienza Università di Roma	Detectors and Accelerators in Particle Physics (Master/laurea magistrale in Physics)
2022	Sapienza Università di Roma	Metodi di Intelligenza Artificiale e Machine Learning in Fisica (Bachelor/laurea in Physics)
2022	Sapienza Università di Roma	Advanced Machine Learning for Physics (Master/laurea magistrale in Physics)
2022	Sapienza Università di Roma	Advanced Machine Learning for Physics (PhD in Physics)
2021	Sapienza Università di Roma	Deep Learning Methods In Physics (PhD in Physics)
2021	Sapienza Università di Roma	Metodi di Intelligenza Artificiale e Machine Learning in Fisica (Bachelor/laurea in Physics)
2021	Sapienza Università di Roma	Detectors and Accelerators in Particle Physics (Master/laurea magistrale in Physics)
2020	Sapienza Università di Roma	Metodi di Intelligenza Artificiale e Machine Learning in Fisica (Bachelor/laurea in Physics)
2020	Sapienza Università di Roma	Detectors and Accelerators in Particle Physics (Master/laurea magistrale in Physics)
2019	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)

2018	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)
2018	SSAS Sapienza	Introduction to Artificial Intelligence and Machine Learning
2018	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2017	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)
2017	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2016	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)
2016	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2015	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)
2015	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2014	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)
2014	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2013	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2012	Sapienza Università di Roma	Artificial Intelligence and Machine Learning (PhD in Physics)
2011	Sapienza Università di Roma	Electromagnetism (Bachelor/laurea in Physics)
2011	Sapienza Università di Roma	Advanced Analysis Techniques in High Energy Physics (PhD in Physics)
2010	Sapienza Università di Roma	Advanced Analysis Techniques in High Energy Physics (PhD in Physics)
2009	Sapienza Università di Roma	Advanced Analysis Techniques in High Energy Physics (PhD in Physics)
2008	Sapienza Università di Roma	Advanced Analysis Techniques in High Energy Physics (PhD in Physics)
2013	Sapienza Università di Roma	Fisica Generale 1 (laurea in Chimica)
2012	Sapienza Università di Roma	Fisica Generale 1 (laurea in Chimica)
2010	Sapienza Università di Roma	Fisica Generale (laurea in Biologia)
2009	Sapienza Università di Roma	Fisica Generale (laurea in Biologia)
1999-2009	Sapienza Università di Roma	assistant to several laboratory and exercise classrooms for students in Physics

Part V - Society memberships, Awards and Honors

Year	Title
2020	Award for “Excellent Teaching” 2018-2019 from the department of Natural, Mathematics and Physics Sciences at Sapienza Università di Roma (first classified in the Faculty of Science)
2017	Award for “Excellent Teaching” 2016-2017 from the department of Natural, Mathematics and Physics Sciences at Sapienza Università di Roma
>=2015	Member of the Italian Society of Physics (SIF)
2017	Recognized as “Top Italian Scientists in Experimental HEP & Astrophysics” (13 th position) and “Top Italian Scientists in all disciplines” (18 th position) by VIA/academy 2017
2013	Awarded as part of the ATLAS and CMS Collaborations with the EPS 2013 High Energy and Particle Physics Prize for an outstanding contribution to High Energy Physics (discovery of the Higgs boson)

Part VI - Funding Information [grants as PI-principal investigator or I-investigator]

Obtained funding as Principal Investigator for ~8.5 MEuros in the last 6 years

Obtained funding as participant to several grant projects for ~10 MEuros in the last 10 years

Year	Title	Program	Grant value
2020	PI international: MUCCA project	CHIST ERA IV CALL 2019	1.1 MEuro
2018/21	PI collaboration: ATLAS Experiment Italian Collaboration	INFN	~3 MEuro/Year
2021	PI Sapienza unit: NBP Project	POR Regione Lazio 2021	37 kEuro
2020	PI Sapienza unit: ATTRACT Project	AIRC Investigator Grant	25 kEuro

2018	PI: A Scalable Artificial Intelligence system for Machine and Deep Learning Research and Training at Sapienza Università di Roma	Sapienza Grandi Attrezzature Scientifiche	300 kEuro
2018	PI: Development of innovative Deep Learning algorithms for highly sparse data and application to the identification of particles produced in the decays of the Higgs boson in LHC experiments	Sapienza Fin. Ateneo	12.5 kEuro
2015	PI: Development and application of new techniques for the direct and indirect research of Dark Matter	Sapienza Fin. Ateneo	9 kEuro
2013	PI: Development of multivariate analysis algorithms to search for Dark Matter signals at the Large Hadron Collider	Sapienza Fin. Ateneo	35 kEuro
2018	I: NEPTUNE “Nuclear process-driven Enhancement of Proton Therapy UNravEled”	INFN Comm. 5 Call	163 kEuro
2017	I: Filo Blu (AI-assisted patient-doctor interactions)	Regione Lazio	696 kEuro
2012	I: GAP-RT (use of GPU for acceleration for real-time systems)	FIRB 2012-2016 (RBFR12JF2Z)	648 kEuro
2017	I: Development of an innovative system for the acquisition and selection in real time of signal events in direct research experiments of Dark Matter	Sapienza Fin. Ateneo	13.8 kEuro
2016	I: GPU deployment for pattern recognition based on machine learning algorithms for trigger systems in High Energy Physics	Sapienza Fin. Ateneo	15 kEuro
2014	I: Development of pattern recognition algorithms for a GPUs cluster in an energy effective real time environment	Sapienza Fin. Ateneo	13 kEuro
2012	I: Search for new physics at LHC	Sapienza Fin. Ateneo	12 kEuro
2011	I: Discovery of the Higgs Boson at the Large Hadron Collider	Sapienza Fin. Ateneo	80 kEuro
2010	I: Observation of the Higgs boson in muon final states with the ATLAS experiment at the LHC collider	Sapienza Fin. Ateneo	35 kEuro
2008	I: Theoretical and experimental aspects of flavor physics and deviations from the Standard Model in the era of direct searches for new particles (additional funding)	Sapienza Fin. Ateneo	35 kEuro
2007	I: Theoretical and experimental aspects of flavor physics and deviations from the Standard Model in the era of direct searches for new particles	Sapienza Fin. Ateneo	35 kEuro

Part VII – Research Activities

My scientific activity since 1989 has been focused in the experimental investigation of the nature of the fundamental interaction, and developed mainly through the participation to the design and running of the experiments L3 at the LEP e^+e^- collider (1989-2000), CDF at the Tevatron $p\text{-}\bar{p}$ collider (1999-2012), ATLAS at the LHC pp collider (2006-today), DarkSide experiment at the LNGS laboratory of INFN (2014-2018), and to the study for experiments at future colliders (FCCee and the IDEA detector concept).

In synergy with this activity since the mid-90s I have also strongly contributed to both the experimental application and the foundational development of modern Machine Learning, Deep Learning and Artificial Intelligence methods, in several research contexts (high-energy physics, astro-particle physics, condensed

matter and statistical physics, applications in medicine and medical imaging, quantum computing and quantum machine learning).

In my research work I have contributed substantially and in first person to three of the most important results in physics of the last 20 years: the discovery of the Higgs boson at LHC (2011-12), to the first observation of the mixing of the Bs meson at Tevatron (first half of years 2000), and to the precise determination of the number of light neutrino families at LEP (years 1990-1995).

Keywords

Brief Description

Higgs Boson Discovery at LHC

In years 2010-2012 I have been the Physics Coordinator of the ATLAS-Italy community (+100 people). In this context I have coordinated and guided the analysis effort carried on by the ATLAS Italian groups in the search for the Higgs boson with the ATLAS experiment at LHC. At the same time I have been involved in first person as one of the main analysers in the ATLAS $H \rightarrow ZZ \rightarrow 4l$ subgroup of the ATLAS experiment, giving substantial contributions in the design and realisation of the $H \rightarrow 4l$ analysis and, after the discovery of the Higgs boson, in the design and realisation of the first analyses that measured the spin-CP quantum numbers of the newly discovered particle. This work resulted first in the evidence then in the observation of a new particle consistent with the Higgs boson of the Standard Model.

Bs Mixing Discovery

In years 2005-2006 I have been the Physics Coordinator of the B physics group of the CDF experiment at Tevatron, responsible for overseeing and guiding the heavy flavor physics program of the CDF-2 experiment, coordinating a group of more than 150 people. In this context I had the possibility to co-convene the group in the very intense and exciting times that led to the first observation and measurement of the flavor oscillation in the Bs meson system. One of the most important and challenging measurements of the Tevatron-II physics programme which held occupied multiple experiments from the end of the 80' to the 2005. In addition to the coordination of the group I have been involved in first person in the development of the analysis tools (I have been the CDF responsible for the particle identification using dE/dx and TOF, for the development of the flavor tagging algorithms used in the Bs mixing analysis, and for the design of the B and D meson official reconstruction software framework).

Novel AI methods for ultra-fast inference in real-time systems

In recent years I have proposed and explored novel ways to improve the capacity of the trigger systems of modern high energy physics experiments to select with extremely low latencies the interesting events. Designing and implementing for the first time new optimisation and model compression techniques based on quantization, knowledge distillation, and input-fragmentation, I demonstrated that it is possible to implement state of the art Deep Neural Network architectures in FPGA accelerators, with marginal occupation of the FPGAs resources and sub microseconds latency. I have successfully applied these methods to a realistic use-case of the Level-0 muon trigger for the Phase-II of the ATLAS detector at the LHC, showing that a deep neural network based algorithm can be effectively implemented in the trigger FPGA, within the latency requirements of the ATLAS trigger, and with competitive performance.

Measurement of the number of light neutrino families

During my degree and PhD years, I have substantially contributed to the measurement of the number of species of light ($m < M_Z/2$) neutrinos, one of the free parameters of the Standard Model that, at that time, was only weakly constrained from cosmological and astrophysical observations. I worked as main analyser in the determination based on the single photon technique and contributed also at the combined results obtained from the line-shape measurements carried on during the LEP runs at center of mass energies around the Z boson resonance. During years from 2001 to 2005 I have been the responsible for the day-by-day reconstruction of the events of the single-photon stream, for the simulation and production of the single-photon data, and for the writeup of the physics publications.

SUSY Monte Carlo Generator for e^+e^-

During the LEP-1.5 and LEP-2 phases of the LEP collider physics program, one of the most interesting experimental questions was related to the strong tension between the Rb measured at LEP and the expectations from the Standard Theory. An intriguing possibility

physics and SUSY searches at LEP

to explain the discrepancy was provided by SUSY models through new particles in the mass range testable at LEP-1.5 and LEP-2. In this context I developed the DFGT Monte Carlo generator used to design and interpret all the SUSY searches at LEP and future linear colliders with polarized beam. The generator for the first time included spin correlations in the production of charginos and neutralinos particles, affecting the experimental sensitivities in the detection of SUSY signals. At the same time I introduced for the first time the concept of the mass difference between the SUSY particle and the LSP as figure of merit to quantify the SUSY analysis sensitivity, a standard quantity used today to quantify experimental results in SUSY models with R-parity conservation.

Other notable achievements:

DarkSide experiment:

- design of the High Level Software Trigger (HLST) trigger system, and of the offline computing model for the DarkSide-20k experiment.

IDEA detector concept:

- design and implementation of novel tau identification techniques based on dynamic graph deep neural network and optimisation of the design of the readout of the dual-readout IDEA calorimeter.

ATLAS experiment:

- design and realisation of the L2 muon trigger algorithms.
- development of novel multivariate and machine learning analysis techniques to maximize the discovery potential for exotic signals from long-lived particles, in the search for DarkMatter signals, and to optimise the measurements of the Higgs boson properties

CDF experiment:

- design and development of the Time-of-Flight detector.
- development of the monitoring of the Secondary Vertex Trigger (SVT);
- responsible of the charged particles identification based on dE/dx measured in the central tracking detector.
- design and realisation of the official reconstruction and analysis software for the B and charm physics analyses

AI and Machine Learning:

- strongly involved in the design and application of machine learning, and deep neural networks for real-time triggering in particle and astro-particle experiments (ATLAS experiment, IDEA dual readout calorimeter proposal for FCC-ee and CepC projects)
- Pioneered the use of multivariate techniques in the first years of 90s to improve analysis sensitivity in collider experiments, and contributed to the development of several MVA algorithms that are widely used today (kernel methods, BDT, DNN, CNN, VAE, graph-Neural Networks)
- Development of novel denoising algorithms for low S/N F19 MRI images based on Variational autoencoders and deep convolutional neural networks (INFN Neptune project)
- Modelling and fast simulation based on deep artificial neural networks of low-energy nuclear interactions for applications in particle therapy, tomotherapy and HEP. (BLOB project, SinoNET project)
- Study of Machine Learning and Deep Learning algorithms for qubit error correction and syndrome decoding in Quantum Computers
- Applications of point cloud graph neural network for the simulation and analysis of complex systems (QCD jet in HEP experiments, spin-glass systems, chaotic systems, and in the analysis of fluid dynamic of human respiratory systems (ATLAS experiment, MED2 project)
- Study and development of novel engineering pipelines for explainable Artificial Intelligence (xAI) in HEP, medical physics, neurosciences (MUCCA collaboration)

- I developed and spread the use and application of machine learning and deep learning methods in the research activities in the physics department and in the INFN section (Roma1 INFN coordinator of the ML_INFN project)
- trained students and researchers in the physics department to use and understand the most modern techniques related to Artificial Intelligence and Machine Learning (teaching AI and ML/DL courses at undergraduate and graduate level at Sapienza university of Rome)
- Proponent and member of the Steering Committee for the new degree course (Laurea) in <i>Science for Artificial Intelligence</i> at the Sapienza University of Rome: in years 2020-2021 I have been among the proponents of a new BSc degree course designed to train graduates who have the solid basic scientific preparation that is necessary to address and contribute to developing the increasingly complex and interesting issues related to artificial intelligence, machine learning and other related disciplines that are developing in the last years. The new degree has been approved to start in academic year 2023.

Part VIII – Summary of Scientific Achievements

I'm author of more than 1700 scientific papers published in peer reviewed international journals (1758 refereed papers, database Scopus, December 26th, 2021). I have been among the main authors and substantially contributed to the results and the writing of the paper for more than 100 of these publications, and for a similar number I have heavily contributed at the reported results with physics studies or by the development of analysis tools extensively used in the result.

Product type	Number	Data Base	Start	End
Papers [international]	1758	Scopus	1992	2021
Papers [international]	1454	Scopus	Last 15 years (2007-2021)	

	Whole Scientific prod.	Last 15 years scientific prod.
Total Citations	99763 (Scopus)	86236 (Scopus)
Average Citations per Product	56.7 (Scopus)	59.3 (Scopus)
H index	133 (Scopus)	128 (Scopus)
Normalized H index*	4.6 (Scopus)	4.4 (Scopus)
Total Journal Impact factor	10258.9 (Web of Science 26/12/21)	8295.7 (Web of Science 26/12/21)
Average Journal Impact Factor per product	5.8 (Web of Science 26/12/21)	5.7 (Web of Science 26/12/21)

*H index divided by the academic seniority (29 years)

I have presented the results of my research as a speaker in 45 national and international congresses and conferences. The complete list of talks is reported in the Part XI of this document.

Part IX– Selected Publications for the evaluation with personal contributions to each publication

1. *Model compression and simplification pipelines for fast deep neural network inference in FPGAs in HEP*

S. Francescato, S. Giagu, F. Riti, G. Russo, L. Sabetta, F. Tortonesi, Eur. Phys. J. C 81, 969 (2021)

Journal IF: 4.59

personal contributions to this work:

I had and made the original idea of implementing specialized artificial neural network for ultra-fast reconstruction and identification of muons in the ATLAS level-0 trigger system. I developed and implemented the artificial neural network architecture based on quantised information and knowledge distillation technique used in the practical implementation in VHDL. Represent one of the most advanced implementations of an artificial neural network (CNN) based inference with latency $< 1\mu\text{s}$ in HEP, with spin-offs in applied physics (motion correction and denoising in MRI medical imaging). I have been one of the editors of the paper.

2. *Search for light long-lived neutral particles produced in pp collisions at root s=13 TeV and decaying into collimated leptons or light hadrons with the ATLAS detector HEP*
 ATLAS Collaboration, Eur. Phys. J. C (2020) 80: 450
 Journal IF: 4.59
 personal contributions to this work:
 I participated as main analyser in all the steps of this analysis in the ATLAS exotic group. I proposed and implemented the methodology used to reconstruct lepton-jets from dark photon displaced decays in the ATLAS detector, wrote the analysis software and statistical tools used to perform the analysis, wrote the interpretation tools needed to cast the experimental results as exclusions in the FRZV dark-sector model. I have been main editor of the ATLAS paper and of the supporting internal ATLAS documentation. I supervised the work performed by two PhD students (C. Sebastiani and I. Longarini) that worked on day by day tasks related to this ATLAS analysis. For this work my PhD student C. Sebastiani has been awarded in 2020 by the ATLAS price for best PhD thesis.
3. *WIMP Dark Matter Searches with the ATLAS Detector at the LHC,*
 S. Giagu, Front. Phys. 7:75 (2019)
 Journal IF: 1.9
 personal contributions to this work:
 Invited review of the current status of searches for WIMP Dark Matter in the ATLAS Experiment. I wrote the entire paper, reviewed and critically analysed the theory status and the ATLAS results produced during Run-1 and Run-2 of HLC. Represents one of the most complete summaries of WIMP Dark Matter results from the ATLAS experiment to date.
4. *Search for dark matter and other new phenomena in events with an energetic jet and large missing transverse momentum using the ATLAS detector,*
 ATLAS Collaboration, JHEP 01 (2018) 126, arXiv:1711.03301 [hep-ex]
 Journal IF: 4.807
 personal contributions to this work:
 I participated to the analysis as one of the main analysers in the ATLAS mono-jet group. I proposed and implemented the improved fitting technique that exploited the shape of the missing transverse momentum distribution to maximize discovery sensitivity at low and high masses. I supervised a PhD (G. Gustavino), and one MSc degree student (G. Frattari) that worked on this ATLAS analysis. The results of this analysis documented in G. Gustavino PhD thesis have been awarded with the Recognized Outstanding Ph.D Research price from Springer Editor, and has been published by Springer Nature. I'm among the authors of the ATLAS supporting note for this analysis.
5. *DarkSide-20k: A 20 tonne two-phase LAr TPC for direct dark matter detection at LNGS,* DarkSide Collaboration,
 Eur. Phys. J. Plus (2018) 133: 131, arXiv:1707.08145 [physics.ins-det]
 Journal IF: 1.919
 personal contributions to this work:
 I participated to the design of the DarkSide-20k detector and in the writeup of the paper as one of the editors. In particular I have been responsible for the design and documentation of the proposed trigger system and for the offline computing system of the DarkSide-20k experiment.
6. *Search for new phenomena in dijet events using 37 fb(-1) of pp collision data collected at root s=13 TeV with the ATLAS detector,*
 ATLAS Collaboration, Phys. Rev. D 96, 052004 (2017), arXiv:1703.09127 [hep-ex]
 Journal IF: 3.797
 personal contributions to this work:
 I participated to the analysis as one of the main analysers in the ATLAS di-jet group. My main contribution has been the interpretation of the experimental results in the context of a Z' mediator model. I supervised a PhD student (S. Francescato), that worked on this analysis as one of the day by day analysers. I'm among the authors of the ATLAS supporting note for this analysis.
7. *Search for new phenomena in dijet mass and angular distributions from pp collisions at root s=13 TeV with the ATLAS detector,*
 ATLAS Collaboration, Physics Letters B 754 (2016) 302-322, arXiv:1512.01530 [hep-ex]
 Journal IF: 3.968
 personal contributions to this work:
 I participated to the analysis as one of the main analysers in the ATLAS di-jet group. I studied the possibility to extend the mass and coupling explored range by exploiting angular correlations between the jet. I supervised a MSc, student (S. Francescato), that worked on this ATLAS analysis as day by day analysers. I'm among the authors of the ATLAS supporting note for this analysis.
8. *Search for a CP-odd Higgs boson decaying to Zh in pp collisions at s^{1/2}=8 TeV with the ATLAS detector,*
 ATLAS Collaboration, Physics Letters B 744 (2015) 163-183, arXiv:1502.04478 [hep-ex]
 Journal IF: 3.968
 personal contributions to this work:
 I participated to this analysis as one of the main analysers in the ATLAS BSM Higgs group. I proposed and implemented a new machine learning based technique to improve the invariant mass resolution in presence of leptonic tau decays in the final state,

that allowed to substantially improve the discovery sensitivity for pseudoscalar Higgs bosons. I supervised the work of 2 MSc students (L.S. Bruni and F. Giuli) that worked in the day by day analysis of the ATLAS data for this search and participated to the writing/editing of both the supporting note and the ATLAS paper.

9. *Search for new phenomena in final states with an energetic jet and large missing transverse momentum in pp collisions at root s=8 TeV with the ATLAS detector*,
ATLAS Collaboration, Eur. Phys. J. C (2015) 75:299, arXiv:1502.01518 [hep-ex]
Journal IF: 4.545
personal contributions to this work:
I participated to the analysis as one of the main analysers in the ATLAS mono-jet group. I proposed and implemented the improved fitting technique that exploited the shape of the missing transverse momentum distribution to maximize discovery sensitivity at low and high masses, that has been used in this and all the following mono-jet searches by ATLAS experiment. I supervised the work performed by two MSc degree students (V. Fabiani and C. Sebastiani) and of a post-doctoral student (V. Ippolito) that worked on day by day tasks related to this ATLAS analysis. I'm among the authors of the ATLAS supporting note for this analysis.
10. *Search for long-lived neutral particles decaying into lepton jets in proton-proton collisions at root s=8 TeV with the ATLAS detector*,
ATLAS Collaboration, JHEP11(2014)088, arXiv:1409.0746 [hep-ex]
Journal IF: 4.807
personal contributions to this work:
I participated as main analyser in all the steps of this analysis in the ATLAS exotic group. I proposed and implemented with Guido Ciapetti the methodology used to reconstruct lepton-jets from dark photon displaced decays in the ATLAS detector, wrote the analysis software and statistical tools used to perform the analysis, wrote the interpretation tools needed to cast the experimental results as exclusions in the Vector Portal model. I have been main editor of the ATLAS paper and of the supporting internal ATLAS documentation. I supervised the work performed by two MSc degree students (A. Castelli and A. Gabrielli) that worked on day by day tasks related to this ATLAS analysis.
11. *Measurement of the Higgs boson mass from the $H \rightarrow \gamma\gamma$ and $H \rightarrow ZZ^* \rightarrow 4\ell$ channels with the ATLAS detector using 25 fb⁻¹ of pp collision data*,
ATLAS Collaboration, Phys. Rev. D 90, 052004 (2014), arXiv:1406.3827 [hep-ex]
Journal IF: 3.797
personal contributions to this work:
I participated as main analyser in all the steps of this analysis in the ATLAS Higgs group. I have been among the authors of the supporting internal ATLAS documentation. I supervised the work performed by a PhD student (V. Ippolito) that worked on day by day tasks related to this ATLAS analysis as main contributor in the ATLAS $H \rightarrow ZZ \rightarrow 4\ell$ analysis group.
12. *Evidence for the spin-0 nature of the Higgs boson using ATLAS data*,
ATLAS Collaboration, Phys. Lett. B 726 (2013) 120, arXiv:1307.1432 [hep-ex]
Journal IF: 3.968
personal contributions to this work:
I participated as main analyser in all the steps of this analysis in the ATLAS Higgs group. I proposed and implemented the fitting model for the novel analysis technique needed to probe the tensor structure in the HZZ vertex based on the angular analysis of the final state leptons in the $H \rightarrow ZZ \rightarrow 4\ell$ channel. I have been among the authors of the supporting internal ATLAS note and directly participated to the editing of the ATLAS paper. I supervised the work performed by a PhD student (V. Ippolito) and one MSc student (G. Gustavino) that worked on day by day tasks related to this ATLAS analysis in the ATLAS $H \rightarrow ZZ \rightarrow 4\ell$ analysis group.
13. *Search for a light Higgs boson decaying to long-lived weakly-interacting particles in proton-proton collisions at $s\sqrt{=7}$ TeV with the ATLAS detector*,
ATLAS Collaboration, Phys.Rev.Lett. 108 (2012) 251801, arXiv:1203.1303 [hep-ex]
Journal IF: 7.888
personal contributions to this work:
I participated as main analyser in all the steps of this analysis in the ATLAS exotic group. I proposed and implemented the methodology used to reconstruct lepton-jets from dark photon displaced decays in the ATLAS detector, wrote the analysis software and statistical tools used to perform the analysis, wrote the interpretation tools needed to cast the experimental results as exclusions in the Vector Portal model. I have been main editor of the ATLAS paper and of the supporting internal ATLAS documentation. I supervised the work performed by two MSc degree students (M. Bettiol and V. Rossetti) that worked on day by day tasks related to this ATLAS analysis.
14. *A Particle Consistent with the Higgs Boson Observed with the ATLAS Detector at the Large Hadron Collider*,
ATLAS Collaboration, Science 338 (2012) 1576-1582
Journal IF: 40.627
personal contributions to this work:
I have been among the principal contributors in the ATLAS experiment in the discovery of the Higgs boson in the $H \rightarrow ZZ \rightarrow 4\ell$ decay mode. I participated as main analyser in all the steps of this analysis in the ATLAS Higgs group. I specifically contributed to the estimate of the ZZ continuum background and in the optimization of the electron and muon quality requirements. I have

coordinated the ATLAS-Italy group involved in the discovery analysis and participated in the writing of the H \rightarrow ZZ \rightarrow 4l internal documentation. I supervised the work performed by a PhD student (G. Artoni) performed for the H \rightarrow ZZ \rightarrow 4l result.

15. *Flavor physics in the quark sector,*

M. Antonelli et al. (140 authors), Phys.Rept.494:197-414 (2010), arXiv:0907.5386 [hep-ph]
Journal IF: 21.477

personal contributions to this work:

I have been among the organizers of the CKM conference and one of the main editors and writers of this summary of the status of heavy flavour physics in the year 2009-2010. In particular I have been responsible of writing the experimental primer and the Bs physics chapter.

16. *Observation of B_s^0 - \bar{B}_s^0 Oscillations,*

CDF Collaboration, Phys.Rev.Lett. 97 (2006) 242003
Journal IF: 7.888

personal contributions to this work:

The most important result from the Tevatron Run-2 physics program, cited among the “Renowned papers” in Spires.

I coordinated the CDF group (+40 people) that performed the measurement. I participated in all the analysis steps from the design to the realisation of the measurement, and I have been one of the editors of the paper.

Part X– Outreach and Science Communication

Year	Brief Description
2019	Writer and editor of the Volume 27 of the Asymmetry Magazine of INFN (article: The Artificial Intelligence Algorithms)
2018-2021	Participation to the Art & science across Italy outreach project
2018	General public seminar: “Introduction to Machine Learning and Artificial Intelligence”, Seminars Of Computational Science, Kitsune Research Project (at Sapienza)
2018	General public Seminar: “L’intelligenza artificiale e il futuro del lavoro”, Festival Science Connection Project
2013-2018	Teacher of preparatory courses for high school students for the Olimpiadi della Fisica OLIFIS
2016	General public seminar for high school students on Dark Matter (Convitto Nazionale, Roma)
2007-2010	CERN Guide for teachers and students visits
2006	Scientist at Notte Eurpoea della Ricerca (scuderie del Quirinale)

Part XI– Seminars and conference talks

1. New methods for the estimation of the background in proportional counters used in spacecraft experiments – contributed talk at SPIE Conference (San Diego, USA, 1992);
2. Measurement of the number of Neutrino Families with single photon method with the L3 experiment at LEP – invited plenary talk at GeLEP (Genova, IT, 1995);
3. Single Photon Physics with L3 experiment at LEP – contributed talk APS05 (Washington DC, USA, 1995);
4. Search for Supersymmetric particles with the L3 detector at LEP – invited talk at DPF06 (Minneapolis, USA, 1996);
5. Search for SUSY at LEP – invited plenary talk at Pi-LEP (Pisa, IT, 1997);
6. The CDF TOF system and B flavor tagging in CDF – invited plenary talk at BEAUTY 2002 (Santiago de Compostela, Spain, 2002);
7. Heavy Flavor Physics at CDF – invited plenary talk at the symposium “ To B or not to B?”, Commissione Nazionale 1 INFN (Frascati, IT, 2003);
8. New results from Heavy Flavor Physics at CDF – invited seminar, Physics Department University of Rome (Roma, IT, 2003);
9. Charm and Beauty Physics at CDF – invited HEP seminar, University of Wisconsin (Madison, USA, 2003);
10. Results on CP Violation from CDF – contributed talk HEP-EuroPhysics EPS03 (Aachen, Germany, 2003);
11. Charm and Beauty Physics - invited lessons at 8th Hellenic School on Elementary Particle Physics (Corfu, GR, 2005);
12. Charm and Beauty Physics at the Tevatron Collider - invited plenary talk at Frontier Science (Milano, IT, 2005);
13. Il Triangolo di unitarietà all’inizio dell’era LHC: abbiamo capito tutto?, - thematic seminar (in italian) on the scientific activities in the Rome Dep. of Physics (Roma, IT, 2006);
14. Strategies for B and charm physics at Tevatron - close-out talk at the CDF collaboration week, (Isola D’Elba, IT, 2006);
15. - Measurement of the frequency of the flavor oscillations of Bs meson”- invited department seminar, Univ. of Rome, (Roma, IT, 2006);
16. Bs mixing measurement at CDF - invited talk at ICHEP 2006, (Moscow, Russia, 2006);

17. New Physics with Bs - invited plenary talk at C2CR07, (lake Tahoe, USA, 2007);
18. Heavy B Hadrons - invited plenary talk at Physics In Collisions 2008, (Perugia, IT, 2008);
19. Search for long lived particles in ATLAS and CMS - contributed talk at ICHEP 2008 (Philadelphia, USA, 2008);
20. Results from the ATLAS experiment at LHC: Mass 2011 conference (Odense, DK, 2011).
21. Standard Model and Higgs physics at LHC: seminar at the “pomeriggi tematici INFN” (Roma, IT, 2011).
22. Exotic searched in ATLAS, invited talk at Interpreting LHC discoveries Conference at GGI (Florence, IT, 2011)
23. ATLAS Results on the search for the Higgs boson: Department seminar Sapienza Univ. of Rome (Rome, IT, 2011)
24. Stato della ricerca del bosone di Higgs con l’esperimento ATLAS a LHC, Seminario Sezione INFN Roma1 (Roma, 22.12.2011)
25. Risultati Recenti Esperimento ATLAS a LHC, invited talk Società Italiana di Fisica XCVIII Congresso Nazionale (Napoli, 17.9.2012)
26. Beyond the Pure State Hypothesis: Higgs to ZZ tensor vertex structure, invited talk ATLAS Higgs Workshop (Orsay, FR, 11.10.2012)
27. Misura delle proprietà del bosone di Higgs, invited talk, Workshop ATLAS Italia (Lecce, 23.10.2012)
28. Exotic Higgs decays at ATLAS, Dark Interactions Workshop 2014 (Brookhaven National Laboratory, USA, 11-13.6.2014)
29. Long-lived particles searches at hadron colliders, invited talk, International conference DHPF2014 (Messina, IT, 24-26.9.2014)
30. Particelle esotiche con lunga vita media messaggere di effetti di nuova fisica: stato delle ricerche con l’esperimento ATLAS a LHC, Seminario INFN-Fisica Particelle Elementari (Roma, IT, 23.2.2015)
31. Search for long-lived particles at LHC, invited talk, International Workshop Light Dark Matter search@Accelerators (LDMA2015) (Camogli, IT, 24-26.6.2015)
32. Long Lived Particles at ATLAS, LHC Long Lived Particle Workshop, invited talk (CERN, May 12 2016)
33. Higgs and New Physics at ATLAS and CMS, invited talk, 55th. International Winter Meeting on Nuclear Physics (Bormio, IT, 23-27.1.2017)
34. Results on flavor anomalies at ATLAS and CMS, ALPS 2018 Conference (Oberurgl, AUS, 15-20.4.2018)
35. L’intelligenza artificiale e il futuro del lavoro, Festival Science Connection Project, 30 Maggio 2018, Sapienza UoR
36. Introduction to Machine Learning and Artificial Intelligence”, Seminars of Computational Science, Kitsune Research Project, 29 Novembre 2018, Sapienza UoR.
37. ATLAS Searches and plans for signals from DarkSectors Models, LHC DM Open Workshop (CERN, 23.6.2018)
38. ATLAS results overview with focus on Dark Matter, Dark Matter and Weak Interaction Conference (DARKWIN) (Natal, BR, 2-13.9.2019)
39. Fast and resource-efficient Deep NN on FPGAs for the Phase-II L0 Muon Barrel Trigger of the ATLAS Experiment, 24th International Conference on Computing in High Energy and Nuclear Physics (CHEP2019) (Adelaide, AU, 4-8.11.2019)
40. Tau Identification in the dual-readout calorimeter, talk at 4th FCC Physics and Experiment Workshop 2020 (Online, 13.11.2020)
41. Artificial Neural Networks, principles and common architectures, Invited Seminar at the 1st ML_INF N Hackathon (Online, June 2021)
42. Model Compression and Simplification Pipelines for fast Deep Neural Network inference in FPGAs in HEP, talk at Offshell 2021 (Online, July 2021)
43. Searches for BSM physics using challenging and long-lived signatures with the ATLAS detector, talk at SUSY 2021 (August 23-28, 2021, China/online)
44. AI-aided tau Identification and reconstruction in the dual-readout calorimeter of IDEA, invited talk at the International workshop on the high energy Circular Electron-Positron Collider (Nanjing, CN, 11.11.2021)
45. Artificial Neural Networks, principles and common architectures, Invited Seminar at the 2nd ML_INF N Hackathon (Online, December 2021)

Part XII– Organization of conferences/work-shops:

1. Chair organizing committee: “CDF Experiment Heavy Flavor Trigger Workshop”, (FNAL, USA, 2003)
2. Co-chair session of Flavor Physics ICHEP04 (Beijing, China, 2004);
3. Co-chair session of Flavor Physics IFAE06 (Pavia, IT, 2006);
4. Member of the organizing committee of the CKM08, (Roma, IT, 2008);
5. Member of the organizing committee of the IFAE 2010 (Roma, IT, 2010).
6. Chair of the organizing committee of the ATLAS Physics Analysis Workshop (CERN 29.9.2010)
7. Chair of the organising committee of the ATLAS Workshop on Long Lived Particles (Roma, 7-8.4.2011)
8. Organizing committee ATLAS Italia annual Workshops from 2011 to 2016;
9. Member of the organizing committee ATLAS Workshop on Searching for Exotic Hidden Signatures with ATLAS in LHC Run2 (Cosenza, February 9-11 2016)
10. Member of the organizing committee LHC Long Lived Particle Workshop (CERN, May 12 2016)
11. Member of the organizing committee Search for Long Lived Particles at LHC Workshop (CERN, April 24-26 2017)
12. Member of the organizing committee and local organisers of the ATLAS Exotic Workshop in Rome (Rome, IT, May 2018)
13. Member of the organizing committee and local organisers of the ATLAS Italy Young Physics Workshop (Online, Sep 2021)
14. Member of the organizing committee of the ATLAS Italy Workshop 2022 (Pisa, June 2022)
15. Co-organizer of the INF N Sezione di Roma Retreat workshop 2022, (Assisi, June 2022)

16. Member of the organizing committee Symposium for the 100 years since the birth of Bruno Touschek, at Sapienza, Laboratori Nazionali Frascati, and Accademia dei Lincei (Rome, IT, Dec 2021)

Part XIII– Thesis Supervision:

MSc thesis:

1. Dr. S. Vallecorsa: “Reconstruction of D meson decays in fully hadronic final state with the CDF detector” (Roma, 2001);
2. Dr. G. Salamanna: “TOF resolution studies using muons from J/psi” (Roma, 2003);
3. Dr. C. Maiani: “Tuning of the Level-2 muon isolation triggers in ATLAS” (Roma, 2008);
4. Dr. V. Rossetti: “Trigger per la selezione di eventi con particelle esotiche neutre a lunga vita nell’esperimento Atlas” (Roma, 2008)
5. Dr. G. Artoni: “Studio di algoritmi per la selezione di muoni dai decadimenti di π e K al secondo livello del trigger dei muoni del rivelatore ATLAS a LHC” (Roma, 2009);
6. Dr. V. Ippolito: “Reconstruction of J/psi \rightarrow $\mu\mu$ with the ATLAS detector” (Roma, 2009);
7. Dr. M. Bettiol: “Search for LeptonJets in the $h \rightarrow \gamma\gamma \rightarrow 4\mu$ decay mode with ATLAS at LHC” (Roma, 2010);
8. Dr. E. Benhar Noccioli: “Studio e messa a punto delle prestazioni dell’algoritmo di ricostruzione di muoni combinati al secondo livello di trigger dell’esperimento ATLAS” (Roma, 2010);
9. Dr. V. Candelise: “Studio e messa a punto delle prestazioni dell’algoritmo di ricostruzione muonica e di isolamento al secondo livello di trigger dell’esperimento ATLAS” (Roma, 2010);
10. Dr. P. Pani: “Ricerca del segnale protone-antiprotone \rightarrow WZ \rightarrow lnu bbbar con l’esperimento CDF al Tevatron” (Roma, 2011)
11. Dr. A. Castelli: “Search for Hidden Valley decays in LeptonJets” (Roma, 2011);
12. Dr. A. Gabrielli: “Ricerca del bosone di Higgs in modelli Hidden Valley con l’esperimento ATLAS a LHC” (Roma, 2011);
13. Dr. S. Mariani: “Misura della vita media degli adroni con b-quark nei canali di decadimento J/psi \rightarrow $\mu\mu$ con il rivelatore ATLAS a LHC” (Roma, 2011);
14. Dr. I. Angelozzi: “Ottimizzazione dei criteri di isolamento muonico utilizzati nel sistema di trigger dell’esperimento ATLAS al CERN” (Roma, 2011);
15. Dr. R. Donnarumma: “Ricerca del bosone di Higgs nel canale di decadimento $H \rightarrow ZZ \rightarrow 2l2q$ con tecniche di analisi multivariata nell’esperimento ATLAS a LHC” (Roma, 2012);
16. Dr. G. Gustavino: “Studio della violazione di CP nel settore dell’Higgs con l’esperimento ATLAS” (Roma, 2013);
17. Dr. F. Giuli: “Ricerca di segnali da bosoni di Higgs pseudoscalari addizionali tramite l’esperimento ATLAS a LHC” (Roma, 2014);
18. Dr. L.S. Bruni: “Ricerca di un bosone di Higgs pseudoscalare nel canale di decadimento $A \rightarrow Zh \rightarrow ll\tau\tau$ con l’esperimento ATLAS a LHC” (Roma, 2014);
19. V. Di Cicco: “Misura della massa del Bosone di Higgs nel canale di decadimento $H \rightarrow \gamma\gamma$ con l’esperimento ATLAS a LHC” (dissertazione laurea triennale, Roma, 2014)
20. Dr. V. Fabiani: “Ricerca di Materia Oscura in eventi con jet adronici ed energia trasversa mancante con l’esperimento ATLAS a LHC” (Roma, 2015);
21. Dr. C. Sebastiani: “Ricerca di Materia Oscura in topologie mono-jet con tecniche multivariate di analisi con l’esperimento ATLAS a LHC” (Roma, 2016);
22. Dr. S. Francescato: “Search for new phenomena in dijet mass and angular distributions from pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector” (Roma, 2017);
23. G. Frattari: “Ricerca di Materia Oscura in topologie mono-jet con l’esperimento ATLAS” (Roma, 2018)
24. L. Sabetta: “Sviluppo di Deep Neural Network su FPGA per il trigger muonico dell’esperimento ATLAS” (Roma, 2018)
25. I. Longarini: “Simulazione veloce di Jet adronici con Generative Adversarial Networks” (Roma, 2018)
26. F. Luzi: “Ricerca di nuove particelle a lunga vita media predette in modelli con settori nascosti” (Roma, 2019)
27. L. Badiali: “Reinforcement Learning visuale con goal autogenerati e applicazioni fisiche” (Roma, 2019)
28. A. Sbandi: “Deep variational Autoencoders for denoising of MRI images with 19F” (Roma, 2019)
29. G. Padovano: “Search for Dark Matter through invisible decays of the Higgs boson produced in VBF processes” (Roma, 2020)
30. G. Albora: “Artificial Intelligence and Deep Learning applications for the identification of Long-Lived particles with the ATLAS detector at LHC” (Roma, 2019)
31. E. Pompa Pacchi: “Re-interpretation of the mono-Jet analysis of the ATLAS experiment in the context of Dark Sector Models” (Roma, 2020)
32. R. Mottarelli: “Search for new phenomena in dijet mass and angular distributions with the ATLAS experiment in Run2” (Roma, 2019)
33. F. Riti: “Ultra-fast Artificial Intelligence for real time reconstruction of muons in the ATLAS experiment at HL-LHC” (Roma, 2019)
34. G. Salvi: “Sviluppo algoritmi innovativi per la selezione in tempo reale (trigger) di nuove particelle neutre di lunga vita media predette da modelli di fisica con settori nascosti con l’esperimento ATLAS a LHC” (Università de Geneve + Rome co-tutoring, 2019)
35. A. Lanteri: “Optimizing two-point correlation statistics using machine learning techniques in new-generation spectroscopic surveys of galaxies” (European Space Agency + Rome co-tutoring, 2020)

36. A. Cacioppo: "Deep learning for the parameter estimation of tight-binding Hamiltonians" (Max Plank Institute for Intelligent Systems + Roma co-tutoring, 2020)
37. F. Santangelo: "Feasibility of using long-lived mono-Dark Photons signals as a probe for light Dark Matter at LHC" (Sapienza, 2020)
38. C.B. Falzi: "Studio del rumore e applicazioni di Machine Learning su immagini di Risonanza Magnetica pesate in diffusione" (Sapienza, 2020)
39. F. Morodei: "Physics driven Data Augmentation techniques for identification of displaced Jets with the ATLAS experiment at the LHC" (Sapienza, 2020)
40. S. Bordoni: "Decoding topological codes with neural networks" (Sapienza, 2020)
41. F. Tortonesi: "AI and transfer knowledge for Ultra-fast Artificial Intelligence in real time systems in HEP" (Sapienza, 2021)
42. L. Torresi: "AI for tau identification in the IDEA dual readout calorimeter" (Sapienza, 2021)
43. G. Tuttobene: "Applications of Generative Deep Learning methods to low energy nuclear interaction models" (Sapienza, 2021)
44. E. Agrimi: "Prognosis and optimization of COVID-19 therapy through AI-driven analysis of CT and clinical data", (Sapienza, 2021)
45. L. Rossi: "Emulate a low energy nuclear interaction model with Deep Learning" (Sapienza, 2021)
46. L. Serra: "Sviluppo di procedure innovative per la selezione di feature radiomiche robuste", (Sapienza, October 2021)
47. G. Russo: "Development and study of the performances of novel algorithms on FPGAs for muon reconstruction and identification in the ATLAS L0 Muon Barrel Trigger" (Sapienza, October 2021)
48. L. Rambelli: "Sviluppo e test di un dimostratore per algoritmi di trigger di alto livello basati su DeepNN su acceleratori commerciali SoCs e ACAPs su schede PCIe per il Run-3 dell'esperimento ATLAS a LHC" (Sapienza, October 2021)
49. M. Di Filippo: "Sviluppo di un Deep Neural Network per l'identificazione del leptone tau nel calorimetro dual-readout e misura della sua polarizzazione in un futuro collider e+e-" (Sapienza, 2021)
50. L. Ceccarelli: "Sviluppi teorici in topological quantum field theory e sviluppo di nuovi algoritmi per l'encoding topologico di informazioni basati su quantum neural network, e applicazioni allo studio di materiali topologici", (Sapienza, 2021)
51. H. Bouzidi: "Innovative denoising algorithms based on DNN for MRI imaging", (Sapienza, October 2021)
52. J. P. Oommen: "Recasting framework for the Displaced Dark Photon analysis of the ATLAS experiment and reinterpretation in different new physics models" (Sapienza, ongoing)
53. M. Ciacchi: "Point Cloud Graph CNN and analysis of spin glass systems" (Sapienza, ongoing)
54. L. Di Fruscia: "Graph Neural Network per la prognosi e la simulazione funzionale e della fluidodinamica in sistemi respiratori di pazienti affetti da covid-19", (Roma, ongoing)
55. D. Fiacco: "Algoritmi basati su deep learning geometrico per l'identificazione di leptoni tau nell'esperimento ATLAS", (Roma, ongoing)
56. A. Baiocchi: "Studio di algoritmi di Deep Learning basati su Graph Neural Network per la classificazione e la ricomposizione di oggetti solidi divisi in frammenti", (Roma, ongoing)
57. E. Cassetta: "Artificial Intelligence for non-linear spectroscopy", (Sapienza, ongoing)

PhD thesis:

1. Dr. S. De Cecco: "Measurement of relative branching fractions for D0 meson Cabibbo suppressed hadronic decays, from the CDF secondary vertex trigger sample at the Tevatron collider" (Roma, 2003);
2. Dr. K. Giolo: "B meson lifetimes determination in fully hadronic decays" (Purdue USA, 2005);
3. Dr. M. Donegà: "Measurement of the lifetime and $\Delta\Gamma$ s of the Bs meson in the decay mode $B_s \rightarrow hh$, with the CDF detector" (Ginevra, 2005);
4. Dr. G. Salamanna: "Measurement of Bs oscillations at CDF" (Roma, 2006);
5. Dr. ssa C. Maiani: "Production x-sections and lifetime determination of $b \rightarrow J/\psi X \rightarrow \mu\mu X$ " (Roma, 2011);
6. Dr. G. Artoni: "Search for $H \rightarrow ZZ \rightarrow 4\mu$ with the ATLAS detector" (2012);
7. Dr. V. Ippolito: "Measurement of the Higgs boson properties with the ATLAS detector" (2013);
8. Dr. G. Gustavino: "Search for New Physics in Mono-jet Final States in pp Collisions" (Roma, 2016);
 - a. The work done with Gustavino won the Recognized Outstanding Ph.D Research price from Springer Editor, and has been published by Springer Nature: DOI: 10.1007/978-3-319-588871-1
9. Dr. C. Sebastiani: "Ricerca di nuove particelle a lunga vita media predette in modelli con settori nascosti" (Roma, 2019).
10. Dr. S. Francescato, "Search for new phenomena in dijet mass and angular distributions with the ATLAS experiment in Run2" (Roma, 2021)
11. Dr. L. Sabetta: "Ricerca di decadimenti invisibili del bosone di Higgs nel canale di produzione VBF con l'esperimento ATLAS" (Roma, ongoing)
12. Dr. I. Longarini: "Ricerca di dark-photon e applicazioni in hep di DeepLearning" (Roma, ongoing)
13. Dr. G. Padovano: "Standard Model precision physics with tau leptons with the ATLAS experiment at the LHC", (Roma, ongoing)
14. Dr. ssa E. Pompa Pacchi: "Dark sector searches in final states with long-lived or prompt neutral particles with the ATLAS detector and upgrade of the L0 muon trigger for HL-LHC", (Roma, ongoing)
15. Dr. F. Morodei: "Z to tau-tau differential cross-section measurement with the ATLAS experiment and upgrade of the L0 muon trigger for HL-LHC", (Roma, ongoing)

16. Dr. T. Torda: "Interpretability and explainability IA in advanced Neural Networks for Topological Quantum Field Theory, Neuroscience and Medical Application", (Roma, ongoing)
17. Dr.ssa A. Maiuro: "Sviluppo di protocolli NMR per la diagnostica medica" (Roma, ongoing)
18. Dr.ssa G. Russo: "Anomaly detection for New Physics searches at the HLC and upgrade of the L0 muon trigger for HL-LHC", (Roma, ongoing)
19. Dr. S. Bordoni: "Quantum computers as AI accelerators for quantum machine learning algorithms", (Roma, ongoing)
20. Dr.ssa G. Grillo: "Multi-disciplinary Use Cases for Convergent new Approaches to AI explainability", (Roma, Dottorato Nazionale AI, ongoing)

ROMA 26/12/2021

FIRMA

A handwritten signature in black ink, appearing to read "Stefano Grillo". The signature is written in a cursive style with a long horizontal stroke at the end.