

Curriculum Vitæ of Gianluca Cavoto

- Name: Cavoto
- First Name: Gianluca
- Born: April, 20th, 1973, Asti (Italy)
- Citizenship: Italian
- Professional address (Roma): Sapienza, Univ. Roma, Piazzale A. Moro, 2, 00185 Roma (Italy) Phone: +39+06 4991 4344;
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Research performances

Research funding: 2.0Meur ERC-CoG, 1.5Meur(INFN, MIUR, FP7, Royal Society);
publications: more than 500 in int.journal with almost 30000 citations (principal author of 4 papers with more than 100 citations), numerous publications in conference proceedings, more than 50 oral presentations at conferences, seminars and meetings; **career supervision:** 5 postdocs, 5 PhD students, more than 10 laurea students.

last update May 2016

Education

- January 16th, 2002 **Ph.D. in Physics**, thesis: *Measurements of Branching Ratios and CP violating asymmetries in $B \rightarrow \pi^+\pi^-$ and $B \rightarrow K^\pm\pi^\mp$ decays with the BaBar experiment*, supervisor Prof. F.Ferroni, Sapienza Univ. Roma.
- 2000-2001 About **two years** at **SLAC (Stanford Linear Accelerator Center)**, Menlo Park, California (USA) working with the *BaBar* collaboration at my Ph.D. thesis subject.
- Nov 1998 - Oct 2001 Graduate School in Physics, (**XIV** ciclo), Sapienza Univ. Roma.
- 1998 INFN post-lauream fellowship - INFN Roma *BaBar* experiment.
- 29th January 1998 Graduation in Particle Physics at Sapienza Univ. Roma with full mark (110/110 cum laude), with the thesis in experimental Particle Physics: *CP Violation at BaBar: isospin analysis for $\sin 2\alpha$ measurement*, supervisor Prof. F. Ferroni.
- 1992 Diploma of secondary studies (Liceo Classico V.Alfieri - Asti) with full marks (60/60 cum laude).

Job Positions

- Since 2016 **Associate Professor** Dipartimento di Fisica - Sapienza Università di Roma
- Since 2005 **Permanent Ph.D. Staff reasercher**, Ricercatore III livello INFN Roma.
- May 2002 - Oct 2004 **Research Staff Member** (R.H. Dicke Fellow) with **Princeton University (USA)**. Working at the *BaBar* experiment at SLAC, California (USA).
- April 2002 -Dec 2005 **Research Associate** Dipartimento di Fisica - Università "La Sapienza" (Roma)

Academic titles

- 2014 I obtained the Abilitazione Scientifica Nazionale (**ASN 2012**) in **Seconda Fascia** settore conc. **02/A1** Fisica Sperimentale delle interazioni fondamentali.

Project leaderships with Grants

- 2016 **Coordinator** of the **DCaNT** project financed by INFN CNS5 - low kinetic energy ion channeling in carbon nanotubes. Demonstrate that CNT can be used as target for a directional dark matter detector. Total budget: **55 keuro**.
- 2014-2019 European Research Council Consolidator Grant (**ERC-CoG**) for the project **CRYSBREAM** - *Crystal channeling to extract a high energy hadron beam from an accelerator machine*. Host Institution: **INFN**. Total budget: **2000K euro**. Use a bent crystal to extract parasitically a beam of protons or ions from the LHC for fixed target experiments. Develop, build and test high quality large bending crystals with advanced motion mechanics, develop and test detectors for beam characterization and detectors for total cross section measurements relevant for Cosmic Rays physics.
- 2010-2014 Grant **FIRB - Programma "Futuro In Ricerca di Base"**, *Crystal channeling and future accelerator*, total budget **303K euro** financed by MIUR, Italian Ministry for University and Research. Very competitive selection (2.8% success rate) to support young researcher towards their independence. Budget to develop devices for crystal channeling experiments (goniometers, beam monitoring).
- Since end of 2009 - today **INFN Italian coordinator** of the **UA9** collaboration (*rappresentante nazionale CNSI*) - experiment for hadron beam collimation with crystal channeling. **Leader of 5 INFN groups** (Univ. Ferrara, Laboratori Nazionali di Frascati, Laboratori Nazionali di Legnaro, INFN Napoli and INFN Roma for total of about **25 staff people**) with key roles in: crystal production and crystal testing; detector development, construction and operations for tests of crystals on the circulating beam (**SPS** and **LHC**); vacuum technology (high precision goniometer); simulation of the accelerator dynamics. Total budget since 2010: about **1021K euro** in total for detector R&D, construction and commissioning, data-taking and crystal testing. The most recent achievement has been the installation of bent crystals into the LHC.
- Since 2009 - today **INFN Roma local coordinator** of the **UA9** collaboration group (crystal channeling and beam collimation). Budget about **50k euro per year** for detector construction, goniometer construction and commissioning and data-taking at CERN. Three post-docs and laurea students.
- 2010-2013 **FP7 EuCARD** project (Work package 8), new material for collimation. Budget **40Keuro**.
- 2008-2009 **Royal Society Grant** to collaborate on the **Super-B** project with Queen Mary and Elizabeth College (London, UK). Budget **6K pounds**.
- 2006-2008 **INFN Roma local coordinator** of the **H8RD22** collaboration group (crystal channeling phenomena). Budget: about **20K euro per year** for detector construction and data-taking at CERN.

- **PRIN** 2007-2008 (Progetto di Interesse Nazionale) on crystal channeling and beam collimation. Budget for INFN Roma **30K euro** for short term post-doc contracts, detector R&D.

Scientific leaderships

- 2010-2013 **MEG physics** coordinator, data analysis activity coordinator for the whole experiment, main responsible for results publication (more than 100 citations for each paper).
- 2008 -2012 **MEG** shift coordinator.
- Since 2005 **convenor** in several edition of **CKM Workshops**.
- Since 2007 **convenor** of Heavy Flavor Averaging Group (**HFAG**) providing official averages for PDG.
- 2004-2008 **chairman** of several BaBar data analysis review committees.
- 2003 **Operation Manager** of the muon and neutral hadron identification system of BaBar based on RPC technology (IFR) of the *BaBar* experiment.
- 2000 - 2004, *Charmless B decays* and *Charmless TwoBody B decays* **analysis working groups coordinator** within the *BaBar* collaboration. Charge of those groups is the **measurement of α and γ angles of the CKM unitarity triangle** with branching ratio and CP violation measurements. I lead a group of about 15 physicists working on 7 different data analyses producing very high impact publications.
- 2002-2003 *BaBar Tracking Efficiency* **analysis working group coordinator**.

Committees

- 2012-2014 INFN Premio Resmini and Premio Conversi committee member.
- Since 2010 INFN member in the **Executive Board** of the UA9 collaboration.
- 2009-2011 Researchers **representative** in Consiglio di Sezione at INFN Roma (INFN Roma council).
- 2004-2006 **chairman** of Italian BaBar **Physics Committee**, organizing the Italian groups data analysis activity within the BaBar collaboration.

Conference organizations

- Since 2010 INFN Roma experimental seminars organizer.
- Channeling 2016 international program committee.
- Channeling 2014 international program committee.
- Channeling 2012 international program committee.

- Channeling 2010 international program committee.
- 2008 CKM workshop organizing committee.

Editorial activity

Since 2005 reviewer for Physics Review Letters, Physics Review D, Physics Letters B and *IEEE* Transactions on Nuclear Science.

Summary of all my research activity and scientific achievements.

My research activity started with the study of CP violation in the B meson weak decays and the search of indirect signs of physics beyond the Standard Model in flavour physics. I was a member of **BaBar collaboration** from 1997 [sp46,sp71] to 2012.

More recently my interest shifted to experiments involved in direct detection of new physics as lepton flavour violation in charged lepton decays (**MEG collaboration** since 2007) and I am now involved in the upgrade program MEG-II.

I am also interested in accelerator physics and joined the **H8RD22 collaboration** since 2006 that was aimed to study the coherent interactions of charged particles with crystals and their application to accelerators. Since 2009 I took the leadership of the Italian groups in the **UA9 collaboration** (beam collimation with crystal channeling to upgrade the performance of the LHC).

Thanks to my **ERC-CoG** project **CRYSBEAM** I am currently involved in the extension of the UA9 program to the beam extraction with crystals [bk12].

Recently I started a study of new methods of detecting **dark matter**, namely the detection of galactic dark matter WIMP direction exploiting coherent interactions in carbon nanotubes [sp78,sp81,s25] and a light-shining-thru-wall experiment to detect axion-like particles with microwaves [sp79].

Detecting Dark Matter

- 2016 DCaNT project - demonstrator of carbon ion channeling in carbon nanotubes with a TPC-GEM.
- 2016 STAX project - sensors for sub THz single photon detection
- 2015 - proposals of new scheme of detection of galactic dark matter WIMP direction exploiting coherent interactions in carbon nanotubes [sp78,sp81,c30,s25–s27] and of a light-shining-thru-wall experiment to detect axion-like particles with microwaves [sp79].

Lepton Flavour Violation

- 2012-today Involved in **MEG upgrade** (DCH upgrade project, active target project) [sp87,sp82]
- 2009-2013 **Main author** of the **MEG** data analysis [sp84,sp83,sp61,sp80,sp59,sp55,sp47,c18,o12,o18,s16,s17].
- 2013 Proposal to use IRIDE machine for LFV measurements [bk11].
- 2008-2009 **MEG** detector commissioning (Timing counter calibration) [sp62,sp51,sp52].

- 2008-2012 **MEG** shift coordinator (data taking and data quality).
- Since Jul 2007 member of **MEG collaboration**, an experiment devoted to search for $\mu \rightarrow e\gamma$ transition. Involved in the **commissioning** of the Timing Counter detector and data analysis of the first engineering run.

Accelerator physics.

- studies of a novel source of muons for muon colliders [o21]
- 2015 **Observation of channeling** of 6.5 TeV protons at the **LHC** in bent crystals [sp86, sp85]
- 2011 Proposal of extension of crystal collimation tests to the LHC [bk9]
- 2010-2013 Demonstration of crystal channeling collimation feasibility in SPS [sp76, sp68, sp65, sp63, sp60, sp58, sp56, sp53, sp50, o11]; innovative crystals production and tests [sp69, sp70, sp77, sp75].
- since 2006 member of **H8RD22 collaboration**, studying *crystal channeling* and related phenomena at CERN-SPS; **observation** of *volume reflection* with 400 GeV/c protons [sp33, sp37, sp38, sp39], *nuclear dechanneling* [sp45], *PXR* production [sp54] and other phenomena [sp40, sp44]; development of new technique of collimation for future colliders [sp36, sp42, sp48, sp73, sp74, sp88].
- Since 2009 member of **UA9 collaboration** testing hadron beam collimation with crystal channeling. I took the leadership of the INFN Italian groups within the collaboration in 2010.

Detectors R&D, construction and operations.

- 2014 **UA9**, installation into the **LHC** of two bent crystals for crystal collimation tests: development of goniometers at high repeatability for ultra-high vacuum.
- 2013-today **UA9**, **Cherenkov detector** for **in-vacuum** measurement of deflected beam [spxx, o16].
- 2012- today **MEG upgrade**, member of the MEG **DCH** group involved in the construction of the MEG-II drift chamber detector [bk10, sp72, o20].
- 2012-today **MEG upgrade**, development of a **Active Target** based on thin scintillating fibers readout by SiPM [sp64, sp66, o14, o15].
- 2013 **UA9**, construction of a portable trigger with thin scint. fibers and SiPM readout [o17].

- 2012 UA9, development of an **hodoscope** to monitor the channeled beam with scintillating and silica fibers readout by a multi-anode-PMT [o13].
- 2003 -2004 Limited-Streamer tubes (LST) **production** for IFR-Barrel upgrade, quality assurance activities (project and building of automated machine to measure LST's graphite resistivity), development of reconstruction software [bk2].
- Jan 2003 to Jun2003, **Operation Manager** of the muon and neutral hadron identification system of BaBar based on RPC technology (IFR). My tasks were maintenance and monitoring of the detectors during the data taking period, diagnostic and solution of malfunctioning of this subsystem, study of **RPC ageing** [sp17,sp16,o10] of the new chambers; invited to VII Workshop on Resistive Plate Chambers [o9] and to INFN Roma [s5].
- Oct 2002 - Dec 2003 *Tracking Efficiency analysis working group coordinator*. Vertex detector and drift chamber track efficiency measurements with 5 different analyses. I lead a group of about 10 physicists.
- Jun 2002 - Nov 2002, test, **installation and commissioning** of new RPC detectors, **RPC ageing** studies, front-end electronics repairs.
- Oct 2001 - May 2002, new **RPC production**, quality check and assurance [sp16].

D meson weak decays

- 2011 author of a review on charm mixing [sp57].
- since 2006 **co-author** of **D⁰-mixing analyses** ([sp28]), in particular **main author** of time-dependent Dalitz analysis of $D^0 \rightarrow K\pi\pi^0$ for the extraction of D⁰-mixing parameter ([sp49,sp25]), invited to present this result [s11,s12,s14,s15].
- 2005-2007 **main author** of D⁰ Dalitz analyses, study of scalar mesons in $D^0 \rightarrow K_S\pi^+\pi^-$ decays [sp43,sp41,sp15]). Invited to present results on *D* Dalitz analyses [c16,o8].

B meson weak decays

- Dec 2007-2010 **convenor** of Heavy Flavor Averaging Group (**HFAG**), member since 2005 [bk8,bk7,bk5,bk4].
- 2007 co-authors of Conceptual design report for a Super Flavour factory [bk6].
- since May 06 **convenor** of CKM 2006 in Nagoya (Japan) *Measurements of β and γ in Charm B decays* [o7].
- since Mar 05 **convenor** of CKM 2005 in San Diego (USA) *Measurements of β and γ in Charm B decays* [o6].

- 2004-2006, **main author** of analysis searching for the very rare decays $B^0 \rightarrow l^+l'^-$ [sp35, sp14].
- 2004-2006, **main author** of the analysis to extract the **angle γ of CKM matrix** in $B^- \rightarrow D^{(*)0}K^-$ with a Dalitz analysis [sp41, sp15] , invited talk at ICHEP06 on γ measurement in BaBar [o4].
- 2005-2007 **main author** of the analyses measuring time-dependent CP violation in $b \rightarrow s$ and $b \rightarrow d$ transitions, **searching for New Physics effect** with Dalitz analyses, branching fractions and CP violation measurements [sp31, sp30, sp21, sp19, sp12]; **advisor** of Ph.D thesis on this subject.
- 2004, **main author** of the analysis showing the observation of **direct CP violation** in $B^0 \rightarrow K^+\pi^-$ decays ([sp9]), invited to present this results [s6], see also press release <http://www.infn.it/news/news.php?id=332> .
- 2004- 2006, **chairman** of Italian BaBar Physics Committee (member since 2003): organization of national BaBar meeting, coordination of INFN computing resources.
- 2000 - 2004, *Charmless TwoBody B decays analysis working group coordinator*. Charge of this group is the **measurement of α and γ angles of the CKM unitarity triangle** with branching ratio and CP violation measurements. I lead a group of about 15 physicists working on 7 different analyses. We have published several papers in refereed journals ([sp34, sp32, sp27, sp23, sp22, sp20, sp18, sp13, sp11, sp10, sp9, sp7, sp6, sp5, sp4, sp3, sp2]), which represent one of the experimental reference for the study of non-leptonic B decays and contain the first published measurements of time-dependent CP asymmetry in the channel $B^0 \rightarrow \pi^+\pi^-$ and observation of new decays channels ([sp3], [sp4]); I have been invited to give a review talk on the B rare decays and α at the *Aspen Winter 2003 Conference on Particle Physics* [c6] , at the *XXXVI QCD Rencontres de Moriond* [o1] and at IFAE (Italy) [c5, o5].
- 2000 -2001 author of flavour tagging algorithm used for time dependent CP violation measurement [sp1].
- **chairman** of several BaBar review committee (branching fraction and time-dependent CP measurement of $B^0 \rightarrow \rho^+\rho^-$ [sp8, sp26] and time-dependent CP Dalitz analysis $B^0 \rightarrow \pi^+\pi - \pi^0$ for the measurement of α [sp29, o9].
- 1997- 1998 *BaBar Physics Workshop* , study of sensitivity to twobody charmless B decays [bk1].

Teaching and tutoring Experience

- 2016-2017 Physics class for master students in Pharmacy
- 2009-today I taught two semesters (per year) of a laboratory course on experimental particle physics at Dip.Fisica, Sapienza Univ. Roma. My weekly duties include 4 hours of laboratory instruction for a group of 5-6 students
- Currently I am supervising **two** Ph.D. students (UA9/CRYSEAM) at Sapienza Univ.Roma and **three** INFN post-docs (UA9/CRYSEAM) and tutoring or co-tutoring few laurea students at Dipartimento di Fisica, Sapienza Univ. Roma (also in collaboration with A.D.Polosa).
whose duty is to realize a full small scale particle physics experiments (for instance an hodoscope with scintillating fibers).
- 2011-2014 advisor of one Ph.D. student of Roma MEG group, **E.Ripiccini** , now post-doc at Univ. Geneva.
- 2004-2007 I taught four semesters of general physics, mechanics and laboratory courses. My weekly duties include 6 hours of lecture attendance, 4 hours of laboratory instruction and 2 hours of open office time in consultation for students. I was responsible for grading homework, laboratory work, quizzes and exams.
- 2005-2008 advisor of one Ph.D. student of Torino BaBar group, **M.Pelliccioni**, now permanent **researcher** at **INFN** Torino).
- 2004-2007 advisor of two Ph.D. students of Univ. Roma (BaBar group), **F.Renga** and **E.Dimarco** now both permanent **researcher** at **INFN** Roma.
- since 2003 advisor or co-advisor of more than ten master thesis students in BaBar Roma group, UA9 group and MEG group at Sapienza Univ. Roma (among which **M.Pierini**, permanent researcher at **CERN**; **G.Piacquadio**, fellow at **SLAC**, **M.Vignati**, researcher at INFN Roma and **ERC-Starting Grant recipient**, **E.Baracchini**, now Marie Curie Fellow at INFN Frascati).
- since 2005 advisor of bachelor thesis students (BaBar Roma group and H8RD22 group).
- 2003-2004 supervisor of 4 US students visiting INFN Roma in the exchange program of DOE/INFN.
- 2000-2001 teaching assistant in three semester courses of general physics and particle physics.

Bibliometric parameters.

Citations summary

Generated on 2017-06-06

812 papers found, 798 of them citeable (published or arXiv)

Resoconto delle citazioni	Citeable papers	Published only
Total number of papers analyzed:	798	529
Numero totale di citazioni:	42,480	34,618
Numero medio di citazioni per articolo:	53.2	65.4
Suddivisione degli articoli in base alle citazioni:		
Renowned papers (500+)	10	6
Famous papers (250-499)	13	11
Very well-known papers (100-249)	77	73
Well-known papers (50-99)	124	109
Known papers (10-49)	393	272
Less known papers (1-9)	163	53
Unknown papers (0)	18	5
h_{HEP} index [2]	100	95

See additional metrics

List of relevant publications in journals.

In the following a selection of publications in refereed international journals. To each of these publications I gave a relevant contribution.

- [spxx] V. Puill *et al.*, “The CpFM, an in-vacuum Cherenkov beam monitor for UA9 at SPS,” JINST **12** (2017) no.04, P04029. doi:10.1088/1748-0221/12/04/P04029
- [sp88] W. Scandale *et al.*, “High-efficiency deflection of high energy protons due to channeling along the $\langle 110 \rangle$ axis of a bent silicon crystal,” Phys. Lett. B **760** (2016) 826. doi:10.1016/j.physletb.2016.07.072
- [sp87] A. M. Baldini *et al.*, “Single-hit resolution measurement with MEG II drift chamber prototypes,” JINST **11** (2016) 07, P07011
- [sp86] W. Scandale *et al.*, “Observation of channeling for 6500 GeV/ c protons in the crystal assisted collimation setup for LHC,” Phys. Lett. B **758** (2016) 129.
- [sp85] R. Rossi, G. Cavoto, S. Redaelli, W. Scandale, “Manipulation of hadron beams with bent crystals in circular accelerators,” Nuovo Cim. C **39** (2016) no.1, 263.
- [sp84] A. M. Baldini *et al.* [MEG Collaboration], “Search for the lepton flavour violating decay $\mu^+ \rightarrow e^+ \gamma$ with the full dataset of the MEG experiment,” Eur. Phys. J. C **76** (2016) no.8, 434
- [sp83] A. M. Baldini *et al.* [MEG Collaboration], “Muon polarization in the MEG experiment: predictions and measurements,” Eur. Phys. J. C **76**, no. 4, 223 (2016)
- [sp82] A. M. Baldini *et al.*, “A new cylindrical drift chamber for the MEG II experiment,” Nucl. Instrum. Meth. A **824** (2016) 589.
- [sp81] **G. Cavoto**, E. N. M. Cirillo, F. Cocina, J. Ferretti and A. D. Polosa, “WIMP detection and slow ion dynamics in carbon nanotube arrays,” Eur. Phys. J. C **76** (2016) no.6, 349
- [sp80] A. M. Baldini *et al.* [MEG Collaboration], “Measurement of the radiative decay of polarized muons in the MEG experiment”, Eur. Phys. J. C **76**, no. 3, 108 (2016)
- [sp79] L. Capparelli, **G. Cavoto**, J. Ferretti, F. Giazotto, A. D. Polosa and P. Spagnolo, “Axion-like particle searches with sub-THz photons”, Phys. Dark Univ. **12**, 37 (2016) doi:10.1016/j.dark.2016.01.003 [arXiv:1510.06892 [hep-ph]].
- [sp78] L. M. Capparelli, **G. Cavoto**, D. Mazzilli and A. D. Polosa, “Directional Dark Matter Searches with Carbon Nanotubes ”, Phys. Dark Univ. **9-10** (2015) 24 Erratum: [Phys. Dark Univ. **11** (2016) 79] doi:10.1016/j.dark.2015.12.004, 10.1016/j.dark.2015.08.002 [arXiv:1412.8213 [physics.ins-det]].

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- [sp77] W. Scandale *et al.*, “Comparative results on the deflection of positively and negatively charged particles by multiple volume reflections in a multi-strip silicon deflector ” JETP Lett. **101**, no. 10, 679 (2015). doi:10.1134/S0021364015100124
- [sp76] W. Scandale *et al.*, “Observation of strong leakage reduction in crystal assisted collimation of the SPS beam” Phys. Lett. B **748**, 451 (2015) Erratum: [Phys. Lett. B **750**, 666 (2015)]. doi:10.1016/j.physletb.2015.07.040, 10.1016/j.physletb.2015.09.001
- [sp75] R. Rossi, **G. Cavoto**, D. Mirarchi, S. Redaelli and W. Scandale, “Measurements of coherent interactions of 400 GeV protons in silicon bent crystals,” Nucl. Instrum. Meth. B **355**, 369 (2015). doi:10.1016/j.nimb.2015.03.001
- [sp74] Babaev, A.A. and **Cavoto**, G. and Dabagov, S.B., ‘On the deflection of a positron beam by the miscut surface of an oriented crystal,” JETP Letters **100** 9 (2015) 550-554.
- [sp73] W. Scandale, *et al.*, ‘Observation of nuclear dechanneling length reduction for high energy protons in a short bent crystal,” Phys. Lett. B **743** (2015) 440.
- [sp72] **G. Cavoto**, *et al.*, “Study of the single cluster response of a helium-isobutane drift chamber prototype using 8 keV X-rays,” JINST **10** (2015) 03, P03012 [arXiv:1410.8719 [physics.ins-det]].
- [sp71] A. J. Bevan *et al.* [BaBar and Belle Collaborations], “The Physics of the *B* Factories,” Eur. Phys. J. C **74** (2014) 11, 3026 [arXiv:1406.6311 [hep-ex]].
- [sp70] W. Scandale, *et al.* [UA9 Collaboration] “ Mirroring of 400 GeV/c protons by an ultra-thin straight crystal” Phys. Lett. B **734**, 1 (2014).
- [sp69] W. Scandale, *et al.* [UA9 Collaboration] “ Deflection of high energy protons by multiple volume reflections in a modified multi-strip silicon deflector” Nucl. Instrum. Meth. B **338**, 108 (2014).
- [sp68] W. Scandale, *et al.* [UA9 Collaboration] “Observation of focusing of 400 GeV/c proton beam with the help of bent crystals” Phys. Lett. B **733**, 366 (2014).
- [sp67] J. Adam *et al.*, Nucl. Phys. Proc. Suppl. **248-250**, 108 (2014). doi:10.1016/j.nuclphysbps.2014.02.019
- [sp66] A. Papa, **G. Cavoto**, E. Ripiccini and M. D. Gerone, “A simulation tool for scintillating fibers coupled to SiPM for MIP and heavy ionizing particle identification” JINST **9**, C05066 (2014).
- [sp65] W. Scandale, *et al.* [UA9 Collaboration] “Optimization of the crystal assisted collimation of the SPS beam” Phys. Lett. B **726**, 182 (2013).
- [sp64] A. Papa, **G. Cavoto** and E. Ripiccini, “Development of an active target for $\mu \rightarrow e\gamma$ search”, Nucl. Instrum. Meth. A **718** (2013) 580.

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- [sp63] A. Babaev, **G. Cavoto** and S. B. Dabagov, “The loss of ions at beam multiple passage through a bent crystal,” Nucl. Instrum. Meth. B **309** (2013) 120.
- [sp62] J. Adam, *et al.* [MEG Collaboration], “The MEG detector for $\mu \rightarrow e\gamma$ decay search,” Eur. Phys. J. C **73** (2013) 2365 [arXiv:1303.2348 [physics.ins-det]].
- [sp61] J. Adam *et al.* [MEG Collaboration], “New constraint on the existence of the $\mu \rightarrow e\gamma$ decay,” Phys. Rev. Lett. **110**, 201801 (2013) arXiv:1303.0754 [hep-ex].
- [sp60] W. Scandale, *et al.* [UA9 Collaboration], “Strong reduction of the off-momentum halo in crystal assisted collimation of the SPS beam,” Phys. Lett. B **714** (2012) 231.
- [sp59] **G. Cavoto**, “Searching for $\mu \rightarrow e\gamma$ with MEG”, Il Nuovo Cimento C, **6** (2012), 97-104
- [sp58] **G. Cavoto**, “Crystal collimation of hadron beam, the UA9 experiment,” Nuovo Cim. C **034N06** (2011) 36.
- [sp57] **G. Cavoto** and M. Pelliccioni, “Quark flavor mixing, last came the charm,” Riv. Nuovo Cim. **034** (2011) 643.
- [sp56] W. Scandale, *et al.*, [UA9 Collaboration] “Comparative results on collimation of the SPS beam of protons and Pb ions with bent crystals,” Phys. Lett. B **703** (2011) 547.
- [sp55] J. Adam *et al.* [MEG Collaboration], “New limit on the lepton-flavour violating decay $\mu^+ \rightarrow e^+\gamma$,” Phys. Rev. Lett. **107** (2011) 171801 [arXiv:1107.5547 [hep-ex]].
- [sp54] W. Scandale, *et al.* [UA9 Collaboration], “Observation of parametric X-rays produced by 400-GeV/c protons in bent crystals,” Phys. Lett. B **701** (2011) 180.
- [sp53] W. Scandale, *et al.*, [UA9 Collaboration] “The UA9 experimental layout,” JINST **6** (2011) T10002 [arXiv:1106.5861 [physics.acc-ph]].
- [sp52] J. Adam *et al.* [MEG Collaboration], “Calibration and monitoring of the MEG experiment by a proton beam from a Cockcroft-Walton accelerator,” Nucl. Instrum. Meth. A **641** (2011) 19.
- [sp51] M. De Gerone, *et al.*, “The MEG timing counter calibration and performance,” Nucl. Instrum. Meth. A **638** (2011) 41.
- [sp50] W. Scandale, *et al.*, [UA9 Collaboration] “First results on the SPS beam collimation with bent crystals,” Phys. Lett. B **692** (2010) 78.
- [sp49] B. Aubert *et al.* [The BABAR Collaboration], “Measurement of D^0 - \bar{D}^0 mixing from a time-dependent amplitude analysis of $D^0 \rightarrow K^+\pi^-\pi^0$ decays”. Phys. Rev. Lett. **103**, 211801 (2009) arXiv:0807.4544 [hep-ex].
- [sp48] W. Scandale, *et al.*, [H8RD22] “Observation of Multiple Volume Reflection of Ultrarelativistic Protons by a Sequence of Several Bent Silicon Crystals,” Phys. Rev. Lett. **102** (2009) 084801.

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- [sp47] J. Adam *et al.* [MEG Collaboration], “A limit for the $\mu \rightarrow e\gamma$ decay from the MEG experiment,” Nucl. Phys. B **834** (2010) 1 [arXiv:0908.2594 [hep-ex]].
- [sp46] M. Antonelli, *et al.*, “Flavor Physics in the Quark Sector,” Phys. Rept. **494** (2010) 197 [arXiv:0907.5386 [hep-ph]].
- [sp45] W. Scandale *et al.* [H8RD22 Collaboration], *Observation of nuclear dechanneling for high energy protons* Phys. Lett. B **680**, 129-132 (2009)
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- [sp4] “*Measurement of branching fractions and CP violating asymmetries in $B^0 \rightarrow \pi^+\pi^-$, $K^+\pi^-$, K^+K^- decays*”, [BABAR Collaboration] (B. Aubert et al.). Phys. Rev. Lett. **89**, 281802 (2002), ArXiv:hep-ex/0207055.
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- [sp2] *Measurement of Branching Fractions and search for CP violating charge asymmetries in charmless twobody B decays into pions and kaons*, [BABAR Collaboration] (B. Aubert et al.), SLAC-PUB-8838, BABAR-PUB-01/10, May 2001. Published in Phys.Rev.Lett. **87**, 151802 (2001), e-Print Archive: hep-ex/0105061
- [sp1] *Observation of CP violation in the B^0 meson system.* [BABAR Collaboration] (B. Aubert et al.), SLAC-PUB-8904, BABAR-PUB-01/18, Jul 2001. Published in Phys. Rev Lett. **87**, 091801, 2001, e-Print Archive: hep-ex/0107013

Talks to conferences and workshops.

- [c31] Jun 2017 CYGNUS 2017 workshop on directional dark matter detection Xichang, Sichuan (China), invited talk on *Experimental tests of negative ion TPC*
- [c30] Jul 2016, IDM 16 Sheffiled (UK) invited talk on *Carbon nanotubes as a target for directional WIMP detection* ;
- [c29] Jun 2016, FPCP 16 Los Angeles (USA), invited talk on *The $\mu \rightarrow e\gamma$ final search with MEG and MEG-II status* ;
- [c28] Jun 2015 CYGNUS 2015 workshop on directional dark matter detection Los Angeles (USA), invited talk on *Experimental tests of ion channelings in carbon nanotubes*
- [c27] Jun 2015 LDMA2015 International Workshop, Camogli (Italy), invited talk on *Carbon nanotubes potentialities for directional searches of dark matter particles with $M \gtrsim 10$ GeV*
- [c26] Oct 2015 Small Angle Spectrometer at LHC workshop, talk on *Channeling for high- xF*
- [c25] May 2014, FPCP 14 Marseille (France), invited talk on *Searching for $\mu \rightarrow e\gamma$ with MEG and MEG-II* ;
- [c24] Apr 2013 ” Searching for the mu to e gamma decay with the present and future MEG experiment” 2013 International Workshop on Baryon and Lepton Number Violation From the Cosmos to the LHC, April 8-11, 2013, MPIK Heidelberg, Germany
- [c23] Jun 2012 ”Analysis tools: the heavy quark sector”, International Workshop on new partial wave analysis tools for next generation hadron spectroscopy experiments, ATHOS 2012, Jun 2012 Camogli
- [c22] Mar 2012 Lepton Flavour Violation with MEG, 26-me Rencontres de Physique de La Valle d’Aoste, 26-3 Mar 2012, La Thuile, Italy
- [c21] Apr 2011 ”Crystal collimation of hadron beam at CERN, the UA9 experiment” Incontri di Fisica delle Alte Energie, Perugia Apr 2011,
- [c20] Sep 2010 Recent MEG results, Neutrino Oscillation Workshop (NOW 2010), 4 -11 Sep 2010, Conca Specchiulla (Otranto) Italy
- [c19] Sep 2010 invited talk on *Bent crystals and accelerator collimation* Società Italiana di Fisica, Congresso Nazionale 2010 ;
- [c18] Sep 2009 invited talk on *First results of MEG experiment* Società Italiana di Fisica, Congresso Nazionale 2009 ;
- [c17] Feb 2009 invited talk at PSI BVR meeting on *Timing Counter calibration of MEG experiment* ;

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- [c16] May 2007, FPCP 07 Bled (Slovenia), invited talk on *Charm Dalitz analyzes* ;
 - [c15] Feb 2007, Incontri italiani di Fisica del B, invited talk on *Rare Hadronic Charmless B decays at BaBar* ;
 - [c14] Dec 2006, CKM Workshop 2006 - Nagoya (Japan), WG5 summary talk;
 - [c13] Dec 2006, CKM Workshop 2006 - Nagoya (Japan), invited talk on *B → ρπ decays*;
 - [c12] Oct 2006, CERN, Flavour in the era of LHC workshop, invited talk on *CKM angles from Babar*;
 - [c11] Sep 2006, Società Italiana di Fisica, Congresso Nazionale 2006, Torino (Italy), invited talk *Measurement of sides and angles of the CKM Unitarity triangle* ;
 - [c10] Nov 2005, CERN, Flavour in the era of LHC workshop, invited talk *Measurements of γ and V_{ub}* ;
 - [c9] Aug 2004, 32nd International Conference on High Energy Physics, ICHEP04, Beijing (China), invited talk *Measurement of γ and sin 2β + γ in BaBar* ;
 - [c8] Apr 2004, XVI Incontro Fisica della Alte Energie, Parma (Italy), invited talk *Measurements of sin 2α at B-factories* ;
 - [c7] Oct 2003, VII Workshop on Resistive Plate Chambers and related detectors, invited talk *BaBar Forward EndCap RPCs*;
 - [c6] Jan 2003, Aspen Winter 2003 Conference on Particle Physics *At the Frontiers of Particle Physics*, invited talk *Rare B Decays and direct CP violation at BaBar*;
 - [c5] Apr 2002, XIV Incontro Fisica della Alte Energie, Parma (Italy), invited talk *Measurements of Branching fractions and CP-violating asymmetries in B⁰ → π⁺π⁻, K⁺π⁻, K⁺K⁻ decays*;
 - [c4] Sep 2001, Società Italiana di Fisica, Congresso Nazionale 2001, Milano-Bicocca (Italy), invited talk *B meson decays to final states with various charm multiplicity in BaBar* ;
 - [c3] Mar 2001, XXXVI QCD Rencontres de Moriond, Les Arcs (France), invited talk *Charmless Hadronic B decays at BaBar*;
 - [c2] Sep 1999, Società Italiana di Fisica, Congresso Nazionale 1999, Pavia (Italy), talk on *First results of BaBar*;
 - [c1] Mar 1997, BaBar Physics Workshop, Princeton (USA), talk on *Towards a isospin analysis in two pions B⁰ decays*.

Seminars.

- [s27] May 2016. Univ. Napoli - *Detecting Dark Matter with CNT*

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- [s26] Feb 2016. Scuola Normale Superiore Pisa - *New Ideas for detecting Dark Matter*
 - [s25] Mar 2015, Sapienza Univ. Roma seminar on *WIMP dark matter directionality detection*
 - [s24] Dec 2014, Univ. Ferrara seminar on *CRYSBREAM project*
 - [s23] Jul 2014, LAL Orsay, seminar on *CRYSBREAM project*
 - [s22] Jun 2014, CERN, seminar to accelerator division on *CRYSBREAM project*
 - [s21] May 2013, Dipartimento di Fisica, Univ. Padova, colloquium on *Lepton flavour violation review*
 - [s20] Mar 2012 CERN, *UA9 instrumentation*
 - [s19] Jan 2012 LAL Orsay, *UA9 instrumentation*
 - [s18] Dec 2011 Roma Tre Dipartimento di Fisica, colloquium on *Searching for $\mu \rightarrow e\gamma$ with MEG*
 - [s17] Sep 2009, Queen Mary University, London, PPRC colloquium on *First results of MEG experiment*
 - [s16] Sep 2009, Galileo Galilei Institute (Firenze), colloquium on *First results of MEG experiment*
 - [s15] Nov 2007, ULB, Bruxelles (Belgium), colloquium on *Observation of D^0 mixing at BaBar*;
 - [s14] Jul 2007, INFN, Laboratori Nazionali di Frascati (Italy), Experimental Seminar *Observation of D^0 mixing at BaBar*
 - [s13] Nov 2006, May 2007 IV and V SuperB Workshop (Frascati-Paris) invited talk on a μ detector project;
 - [s12] Apr 2007, Roma, INFN, Commissione Nazionale Scientifica 1 Meeting, *Observation of D^0 mixing at BaBar* ;
 - [s11] Mar 2007, INFN, Sezione di Roma, Experimental Seminar *Observation of D^0 mixing at BaBar*;
 - [s10] Jun 2006, Roma, Congresso Sezione INFN, seminar on *New Physics, only at LHC ?*;
 - [s9] Jan 2006, INFN, Sezione di Roma, seminar on *CERN future research strategy*;
 - [s8] Apr 2005, Roma, INFN, Riunione Commissione Nazionale Scientifica 1, *New Results of BaBar* ;
 - [s7] Nov 2004, CERN, final meeting RPC at GIF, *Experience with Resistive Plate Chambers at BaBar*

- [s6] Oct 2004, INFN, Sezione di Roma, Experimental seminar *Direct CP violation and rare B decays at BaBar*
- [s5] May 2004, INFN, Sezione di Roma, Experimental seminar *Experience with Resistive Plate Chambers at BaBar*
- [s4] Sep 2003, Barcellona University, colloquium on *CP violation and CKM angles: present status and a glance to the future* ;
- [s3] Jan 2002, Princeton University, High Energy Physics Seminar on *Measurements of CP violating asymmetries with the BaBar detector*;
- [s2] Apr 2001, Università di Roma “La Sapienza”, Experimental Seminar on *Rare Charmless B meson decays* ;
- [s1] Oct 2000, First International School in CP violation, Prerow, Seminar on *Charmless Twobody B decays at BaBar* ;

Conference proceedings.

- [o25] F. Iacoangeli, B. Buonomo, G. Cavoto, L. Foggetta and P. Valente, doi:10.1109/NSSMIC.2014.7431157
- [o24] G. Cavoto, PoS FPCP **2016** (2017) 031.
- [o23] R. Rossi *et al.*, PoS ICHEP **2016** (2016) 867.
- [o22] F. Iacoangeli, V. Bocci, G. Cavoto, M. Garattini, L. Recchia and R. Rossi, doi:10.1109/NSSMIC.2015.7581889
- [o21] M. Antonelli, E. Bagli, M. Biagini, M. Boscolo, G. Cavoto, P. Raimondi and A. Variola, “Very Low Emittance Muon Beam using Positron Beam on Target,” doi:10.18429/JACoW-IPAC2016-TUPMY001
- [o20] A.M. Baldini, et al. , A new cylindrical drift chamber for the MEG II experiment, Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, Available online 10 November 2015, ISSN 0168-9002, <http://dx.doi.org/10.1016/j.nima.2015.10.103>. (<http://www.sciencedirect.com/science/article/pii/S016890021501342X>) Keywords: Gas detectors; High transparency; Drift chamber
- [o19] L. Burmistrov *et al.*, Nucl. Instrum. Meth. A **787**, 173 (2015). doi:10.1016/j.nima.2014.11.089
- [o18] G. Cavoto, “Searching for the mu into e gamma decay with MEG and MEG-II” arXiv:1407.8327 [hep-ex], to appear in FPCP 2014 proceedings (Jul 31, 2014)
- [o17] F. Iacoangeli, V. Bocci, G. Cavoto, L. Recchia and F. Pallotto, “The Thin Light Trigger for the UA9 experiment” 10.1109/NSSMIC.2013.6829750
- [o16] L. Burmistrov, *et al.* “Cherenkov detector for proton flux measurement for UA9 project” 10.1109/NSSMIC.2013.6829430
- [o15] A. Papa, G. Cavoto and E. Ripiccini. “Feasibility study of an active target for the MEG experiment” Nucl. Phys. Proc. Suppl. **248-250**, 121 (2014).
- [o14] A. Papa, A. Antognini, G. Cavoto and E. Ripiccini, “Position, timing and particle ID with scintillating fibers read-out by SiPM,” PoS PhotoDet **2012** (2012) 1 45.
- [o13] F. Iacoangeli, G. Cavoto, R. Santacesaria, and P. Valente, “A Beam Profile Monitor for the UA9 Experiment”, Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), 2012 IEEE, 768-772 (2012)
- [o12] G. Cavoto, “Recent MEG results,” Nucl. Phys. Proc. Suppl. **217** (2011) 324 [arXiv:1012.2110 [hep-ex]].

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- [o11] D. Mirarchi, G. Cavoto, R. Losito, W. Scandale and A. Taratin, “Preliminary results of the crystal collimation test in UA9,” Conf. Proc. C **100523** (2010) TUPEB075.
- [o10] H. R. Band *et al.*, “Performance And Aging Studies Of Babar Resistive Plate Chambers”, Nucl. Phys. Proc. Suppl. **158** (2006), 139.
- [o9] G. Cavoto, “ $B^= \rightarrow \pi^+\pi^-\pi^0$ Time Dependent Dalitz analysis at BaBar,” CKM Workshop 2006 proceedings, arXiv:0704.0571 [hep-ex].
- [o8] G. Cavoto, “Charm Dalitz Analyses,” In the Proceedings of 5th Flavor Physics and CP Violation Conference (FPCP 2007), Bled, Slovenia, 12-16 May 2007, pp 022, [arXiv:0707.1242 [hep-ex]].
- [o7] G. Cavoto, R. Fleischer, K. Trabelsi and J. Zupan, “Angles from B Decays with Charm: Summary of Working Group 5 of the CKM Workshop 2006,” arXiv:0706.4227 [hep-ph].
- [o6] G. Cavoto *et al.*, “Angles from B decays with charm. Summary of Working Group 5 of the CKM Workshop 2005”, arXiv:hep-ph/0603019.
- [o5] G. Cavoto, “Measurement of alpha at the B-factory,” Proceedings IFAE 2004, SLAC-REPRINT-2004-406;
- [o4] G. Cavoto, “Measurements Of Gamma And $\sin(2\beta) + \Gamma$ With Babar,” 32nd International Conference on High-Energy Physics (ICHEP 04), Beijing, China, 16-22 Aug 2004, SLAC-REPRINT-2004-405;
- [o3] “Babar Forward Endcap RPCs,” G. Cavoto, Nucl. Instrum. Meth. A **533** (2004) 46.
- [o2] G. Cavoto, *Measurements of Branching fractions and CP-violating asymmetries in $B^0 \rightarrow \pi^+\pi^-$, $K^+\pi^-$, K^+K^- decays.* in conference proceedings Vol.83 ”XIV Italian Meeting on High Energy Physics”, M. Cacciari, F. Fabbri, and L. Trentadue (Eds.), SIF Bologna 2003.
- [o1] G. Cavoto, *Measurements of Charmless Hadronic B Decays Branching Fraction at BaBar*, BABAR-PROC-00/17, SLAC-PUB-8824, May 2001. Published in the proceedings of 36th Rencontres de Moriond on QCD and Hadronic Interactions, Les Arcs, France, 17-24 Mar 2001, e-Print Archive: hep-ex/0105018

Reports, reviews, new experiment proposals, and books.

- [bk13] J. Alexander *et al.*, “Dark Sectors 2016 Workshop: Community Report,” arXiv:1608.08632 [hep-ph].
- [bk12] Jean-Philippe Lansberg, Gianluca Cavoto, Cynthia Hadjidakis, Jibo He, Cédric Lorcé, and Barbara Trzeciak, *Physics at a Fixed-Target Experiment Using the LHC Beams*, Advances in High Energy Physics, vol. 2015, Article ID 319654, 2 pages, 2015. doi:10.1155/2015/319654
- [bk11] M. Ferrario, D. Alesini, M. Alessandrini, M. P. Anania, S. Andreas, M. Angelone, A. Arcovito and F. Arnesano *et al.*. “IRIDE: Interdisciplinary research infrastructure based on dual electron linacs and lasers” Nucl. Instrum. Meth. A **740**, 138 (2014).
- [bk10] A. M. Baldini, *et al.*, “MEG Upgrade Proposal,” arXiv:1301.7225 [physics.ins-det].
- [bk9] W.Scandale *et al.*, ”LHC Collimation with Bent Crystals - LUA9”, CERN-LHCC-2011-007 ; LHCC-I-019
- [bk8] D. Asner *et al.* [Heavy Flavor Averaging Group Collaboration], “Averages of b -hadron, c -hadron, and τ -lepton properties,” arXiv:1010.1589 [hep-ex].
- [bk7] E. Barberio *et al.* [Heavy Flavor Averaging Group Collaboration], “Averages of b -hadron and c -hadron Properties at the End of 2007,” arXiv:0808.1297 [hep-ex].
- [bk6] M. Bona *et al.*, “SuperB: A High-Luminosity Asymmetric e^+e^- Super Flavor Factory. Conceptual Design Report,” arXiv:0709.0451 [hep-ex].
- [bk5] E. Barberio *et al.* [Heavy Flavor Averaging Group (HFAG) Collaboration], “Averages of b -hadron properties at the end of 2006,” arXiv:0704.3575 [hep-ex].
- [bk4] E. Barberio *et al.* [Heavy Flavor Averaging Group (HFAG)], “Averages of b -hadron properties at the end of 2005” , arXiv:hep-ex/0603003.
- [bk3] G.Cavoto, Translation to Italian of L.Randall *Warped Passages*, 2006.
- [bk2] BaBar LST team, *A Barrel IFR Instrumented with Limited Streamer Tubes*, proposal from the BaBar Collaboration to SLAC Experimental Program Advisory Committee, May 2003
- [bk1] *The BaBar Physics Book*, BaBar Collaboration, P.F.Harrison and H.R.Quinn eds., SLAC Report No.SLAC-R-504 (1998).

Roma, 26 ottobre 2016

In fede, Gianluca Cavoto

Il sottoscritto, **Gianluca Cavoto**, codice fiscale CVTGLC73D20A479P, nato a Asti, il 20 aprile 1973, sesso maschile e residente in Roma, via Mario Musco 35/E, 00147 Roma, tel. 3474132386, consapevole che, ai sensi dell'art. 76 del DPR 445/2000, le dichiarazioni mendaci, la falsità negli atti e l'uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali vigenti in materia, per gli effetti delle disposizioni contenute nell'art. 46 del DPR 445/2000 dichiara sotto la propria responsabilità che

- tutte le informazioni contenute in questo curriculum vitae sono veritiere

Roma, 26 ottobre 2016

In fede, Gianluca Cavoto

Curriculum vitæ of Daniele del Re

Part I – General Information

Born 11th January 1975 in Rome
Citizenship Italian
Status Married with two children
email daniele.delre@roma1.infn.it, daniele.del.re@cern.ch
Spoken Languages Italian, English

Part II - Education

2000 – 2002 **Ph. D. in Physics**, Università "La Sapienza" (Roma), with a dissertation in Particle Physics: "Measurement of $|V_{ub}|$ studying inclusive semileptonic decays on the recoil of fully reconstructed B's with the BaBar experiment". Adviser: Prof. F. Ferroni;
1994 – 1999 **Laurea in Fisica** Università "La Sapienza" (Roma), 110/110 cum laude, with a thesis in Particle Physics: "La Camera a Deriva di BaBar: analisi in linea dei parametri di funzionamento", Advisers: Prof. F. Ferroni, S. Morganti;

Part III - Appointments

Academic appointments

10/2015–now **Professore Associato**; Università "La Sapienza" di Roma;
07/2015-08/2016 **Scientific Associate at Cern**;
03/2006–09/2015 **Ricercatore universitario**; Università "La Sapienza" di Roma; confermato since 03/2009;
07/2011–12/2011 **Cern - INFN fellowship**;
08/2008–01/2009
12/2005–03/2006 **Ricercatore INFN** (art. 36), Sezione di Napoli;
02/2003–12/2005 **PostGraduate Researcher**, step VI, Physics Department, **San Diego**, California;

Abilitazioni

11/2014 **Abilitazione scientifica Nazionale tornata 2013, settore 02/A1 associato**
01/2014 **Abilitazione scientifica Nazionale tornata 2012, settore 02/A1 associato**

Part IV - Teaching Experience

AA 16-17	a) Course in Mechanics, "Sapienza" Physics Department (12 CFU).
AA 14-15 && 13-14 && 12-13	a) Course in Mechanics Laboratory, "Sapienza" Physics Department (12 CFU). b) Teaching assistant for a course in Particle Physics (Prof. F. Ferroni, Dott. S. Veneziano), "Sapienza" Physics Department. c) Lessons to students of high school for the preparation to the Physics Olympics
AA 11-12	a) Course in Physics, "Sapienza", Natural Science Department (6 CFU). b) Teaching assistant for a course in Particle Physics (Prof. F. Ferroni), "Sapienza" Physics Department.
AA 10-11 && 09-10	a) Course in Physics, "Sapienza", Natural Science Department (6 CFU). b) Teaching assistant for a course in Mechanics (Prof. A. Pelissetto), "Sapienza" Physics Department. c) Teaching assistant for a course in Particle Physics (Prof. F. Ferroni), "Sapienza" Physics Department.
AA 08-09	a) Course in Physics, "Sapienza", Natural Science Department (6 CFU). b) Course in Applied Physics, "Sapienza", Scienze della Sicurezza e Protezione. (5 CFU) c) Teaching assistant for a course in Mechanics (Prof. A. Pelissetto), "Sapienza" Physics Department.
AA 08-07	Teaching assistant for a course in Mechanics (Prof. A. Pelissetto), "Sapienza" Physics Department.
AA 05-06	Teaching assistant for a course in Electromagnetism (Prof. Lacava, Mariani, Trevese), "Sapienza" Physics Department.
AA 01-02	Teaching assistant for a course in Physics (Prof. C. Luci), "Sapienza" Pharmacy Department.
AA 00-01	Teaching assistant for a course in Physics II (Prof. G. Marini), "Sapienza" Physics Department.

Part V – Society and Scientific Memberships, Awards, and Honors

2005 - now	CERN (European Laboratory for Particle Physics) user/associate
1998 - 2008	SLAC (Stanford Linear Accelerator Center) user/associate
1996	Winner of " Enrico Persico " Grant, Accademia dei Lincei

Part VI - Funding Information (last 10 years)

11/2015-now	Group leader of CMS Rome group, Principal investigator, INFN specific grant, ~200K euro/year (excluding salaries)
10/2014	Progetto di ricerca d'Ateneo, "Precision timing in high energy physics", Principal investigator, Universita' "Sapienza" Rome, 50K euro
2014 - 2016	CMS Exotica WG coordination, INFN specific grant, Investigator, 28K euro
2013 - 2014	CMS Long-Lived Exotica sub-WG coordination, INFN specific grant, Investigator, 14K euro
2010 - 2012	CMS Jet/MET WG coordination, INFN specific grant, Investigator, 42K

Part VII – Scientific and Academic Activities

Summary and timeline of research activities

CMS

- 2014 – now study of **fast-timing detectors for the upgrade of the CMS electromagnetic calorimeter** for the so-called Phase2, which corresponds to the LHC luminosity increase foreseen in 2025 [c26, pr6]. I obtained a university grant (Fondi d'Ateneo), corresponding to 50K euros, to develop prototypes of fast timing detectors (micro channel plates). This activity produced a publication [p37] and more are in preparation.
- 2010 – 2014 analysis for the search of the **Higgs boson** decaying in **two photons and ZZ/WW** (two leptons, two jets) final states [cs13, cs14, c22, c23, c24]. These studies produced several papers [p21, p22, p23, p23bis, p32] and contributed to the discovery of a new boson at 125 GeV [p24, p26bis]. Collaboration with theorists for the interpretation of the Higgs results [p25].
- 2010 – 2012 **studies of jet properties and composition** for the discrimination between quark and gluon jets and for the rejection of jets from pile-up events [p21,cms15]
- 2007 – 2012 **jet energy calibration** using γ +jet events and studies on alternative jet reconstruction methods [c19], summarized in a paper [p19].
- 2006 – 2014 search of new physics in final states with **photons and MET** in the **Gauge-mediated Supersymmetry Breaking** scenario [c20, c21, c25] and [p26].
- 2006 – now installation, quality control, and maintenance of the **high voltage system of CMS ECAL** [p13].
- 2006 – now **ECAL energy and time calibration** using reconstructed π^0 mesons and energetic photons [cms1, cms3, cms6, cms21].
- 2008 – 2009 measurement of the performance of the **time measurement of the ECAL** using beam-splash and cosmics events collected by CMS. This analysis produced a JINST paper [p17].
- 2006 – 2007 CMS ECAL **H2 and H4 testbeams** (CERN) and study of the energy calibration using high energy electrons and π^0 from **charge-exchange** ($\pi p \rightarrow \pi^0 n$) events. The results are reported in two publications [p12, p14].

BaBar

- 2001 – 2006 measurement of the **CKM parameter V_{ub}** using charmless semileptonic decays of the B meson [c16, c17]. The results of inclusive and exclusive studies have been published on two PRL journal papers, representing the first publications at the B factories with these techniques [p9, p10].
- 2005 – 2006 study of the **$B \rightarrow D^{(*)}D_s(J)$** decays and measurement of the absolute branching ratios of the $D_s J(2460)$ and D_s^+ mesons [c18]. It produced a PRD paper [p11].
- 2003 development of the so-called Computing Model 2, the new and optimized tool to analyze the data of the BaBar experiment.
- 2003 feasibility studies on semileptonic decays to evaluate the potential of an asymmetric B factory at high luminosity [pr0].

- 2001 – 2002 author of the so-called **semi-exclusive reconstruction** to create samples of hadronic B decays reconstructed with high efficiency. This technique has been used by several BaBar analyses, which produced more than 15 journal publications.
- 2000 – 2001 high precision measurement of the **mixing parameter** Δm_d of the neutral B mesons using dilepton events, published on PRL [p5].
- 2000 – 2001 work on K mesons particle identification [p4].
- 1998 – 2002 implementation and contact person of the **online fast-monitoring of the drift chamber** of the BaBar experiment. The result of these activities is reported in a NIM paper [p1].
- 2002 quality control and installation of the new RPC detectors and repair of the Front End electronics for the muon detector (IFR) [p2,p3].

Scientific Coordination

- 11/2016-now **Group leader of of the CMS Rome group.** The Rome group is active in CMS since more than 20 years. It is deeply involved in the maintenance and operation of the electromagnetic calorimeter. The members of the group are expert in photon, electron, and jet reconstruction and have been leaders, being coordinators of several Physics and detector groups. The group counts 12 members with a permanent position in Università Sapienza of Rome and INFN Rome, in average, about 2 postdocs, 3 PhD students and 3 undergraduate students per year. The total budget of the group is about 200K E per year (excluding all salaries: faculty, postdocs and phd students).
- 10/2016-now **member of the EXO/B2G Pub Com Board** of CMS. This group plays a crucial role in maintaining the high standard of CMS publications related to search for new physics.
- 09/2014 – 08/2016 **convener of the CMS Exotica** analysis working group. This is the largest physics group in the CMS experiment and counts hundreds of members. The topics covered by this group include all possible non-SUSY new physics searches done in the experiment. I coordinated more than 70 analyses. This group produced more than 110 papers in total and about 30 papers and almost 50 preliminary results during my convenership (e.g. [p35,p36], full list in [o13]). Thanks to my experience I have been invited to convene the Exotics session at the LHCP conference in 2015 [o12] and to give a talk on the status of these searches at the LHC at the Società Italiana di Fisica (SIF) meeting [c27]. I have also organized two CMS exotica workshops [o8,o11], attended by about 80 people.
- 01/2013 – 10/2014 **convener of the CMS** analysis working group that studies **Long-Lived Exotics Particles**. This group has about 50 members and during my convenership produced 4 papers, now submitted to journal [p29, p30, p31,p33].
- 05/2012 – 05/2014 **convener of the “Jets” subgroup** of the LHC Higgs Cross Section Working Group [o7, p27].
- 02/2010 – 12/2012 **convener of the CMS JetMET working group** that is responsible for the reconstruction and commissioning of Jets and missing transverse energy (MET). These physics objects are used by almost all CMS analyses. This group has about 100 members and produced two published papers [p18, p19] and several CMS public notes. The calibration and the commissioning of jets and MET have been crucial for the earliest CMS searches for new

physics, e.g. [p18bis, p20bis, p22bis].

- 10/2008 – 12/2010 **member of the Editorial Board of the CMS electromagnetic calorimeter (ECAL)**, the committee which examines the ECAL papers.
- 08/2004 – 12/2005 **convener of the BaBar analysis working group that studies the exclusive hadronic B meson decays in final states with charm ($B \rightarrow DX$)**. The group had about 70 physicists. During my convenership, it produced about 20 journal publications, e.g. [p10bis].
- 10/2003 – 10/2005 **coordinator of the Recoil Analysis Forum of the BaBar experiment**. The goal of this forum was the discussion and the coordination of strategies and tool implementations that are in common among the analyses performed on the recoil of reconstructed B mesons.

Organization of international conferences and workshops

- 07/2015 **Chair and organizer of the EXOTICS sessions at the LHCP international conference**, held in Saint Petersburg [o12]. This is one of the most important Summer conferences in HEP. The sessions had in total 16 contributions and about 50 people attended it.
- 11/2015 organizer of the 2015 “**CMS Exotica workshop**”, Venezia [o11]
- 11/2014 organizer of the 2014 “**CMS Exotica workshop**”, Madrid [o8]
- 03/2005 member of the international organizing committee of “**CKM Workshop 2005**” held in San Diego, California [o6].
- 12/2003 organizer of the “**Vxb workshop**” held at Slac in December 2003 [o3].

Referee

- 2016 **member of FY 2017 DOE/HEP Energy Frontier panel**
- 2016–now **president of the panel for postdoc positions (assegni di ricerca) for the LNGS**
- 2016 **referee for Research Grants Council (RCG) of Honk Kong**: both for General Research Fund and Areas of Excellence
- 2016 **referee Swiss National Science Foundation Grants**
- 2016 **referee for programma Vinci, Universita’ Italo-Francese**
- 2014 – now **referee of Journal of High Energy Physics**
- 2010 – now **referee of Physics Letters B**
- 07/2009 – 12/2009 member of the internal review committee of two CMS analyses. The first one studied the ratio of inclusive jet cross sections with radius parameters $R=0.5$ and 0.7 . The second one studied anomalous signals in the hadronic calorimeter of the experiment. Both produced a paper [p16,p28].
- 01/2004 – 04/2006 chair of the internal review committee of two BaBar analyses. The first one studied the inclusive production of charmed mesons in B decays and produced two papers [p6,p7]. The second one measured the absolute branching ratio of $B \rightarrow D^{(*,**)}\pi$ decays and produced a paper [p8].

Academic Activities

- 06/2011–04/2013 **Member of “Giunta di Facolta’, SMFN”**
- 01/2010–03/2011 **Editor of the Scientific Report of Physics Department, Sapienza, years**

2007-2009 [o9]

2007 – 2010

Responsible for the Physics Department web page with national and international academic job offers [o10]

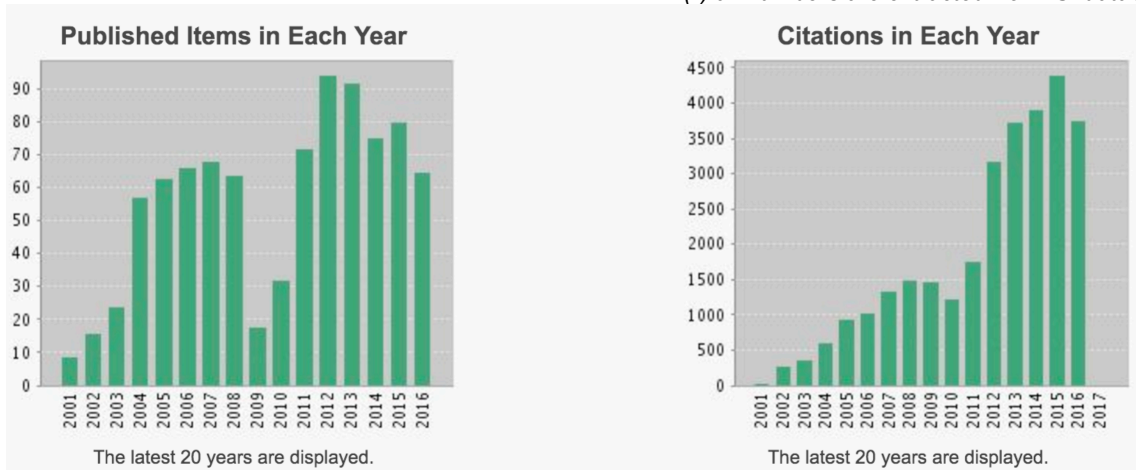
Part VIII – Summary of Research Activities (last update 31/11/2016)

The most up-to-date full list of more than 910 papers can be found at

Inspire: <http://inspirehep.net/search?p=find+author+%22d.%20del%20re%22+and+ps+p>

<i>year of first publication</i>	2001
<i>year of PhD</i>	2003
<i>total number of publications on international peer-reviewed journals</i>	895 (*)
<i>total number of publications on international peer-reviewed journals in the last 10 years</i>	660
<i>total number of citations</i>	29522
<i>total number of citations divided by academic years (15, since first publication)</i>	$29522 / 15 = 1968$
<i>average citations per product</i>	33
<i>h factor</i>	89
<i>h factor divided by the academic years (15)</i>	$89 / 15 = 5.9$

(*) all numbers are extracted from ISI database



More detailed information

Invited talks

- c27 Sep 16 102° Congresso Nazionale, Societa' Italiana di Fisica (SIF), Padova, relazione su invito "Ricerche di fisica oltre il Modello Standard al LHC."
- c26 May 14 16th International conference on calorimetry in high energy physics (CALOR), Giessen, "Timing Performance of the CMS Electromagnetic Calorimeter and Prospects for the Future"
- c25 May 13 Sixth Italian workshop on p-p Physics at LHC, Genova "Particelle esotiche a vita media lunga"
- c24 Feb 13 Lake Louise Winter Institute, 60 minutes invited talk on "Higgs results from

CMS

- c23 Jul 11 EPS-HEP 2011, International Europhysics Conference on High Energy Physics. Invited talk: "*A Search For The Higgs Boson In The Channel $H \rightarrow \gamma\gamma$ With The CMS Detector*"
- c22 Sep 11 5th International Workshop "From Parity Violation to Hadronic Structure and more...", held in Rome. Invited talk "*News from the LHC*".
- c21 Mar 08 XLIIIth Rencontres de Moriond, QCD and High Energy Interactions. "*Searches for GMSB and for high ET Dilepton pair events at the LHC*"
- c20 Feb 08 Fifth Italian workshop on p-p Physics at LHC, Perugia "*Beyond the Standard Model and Exotics*"
- c19 Feb 08 Workshop on Montecarlo, physics and simulation at the LHC, Frascati "*Jet energy corrections and calibration at CMS*"
- c18 Aug 06 33rd International Conference on High Energy Physics (ICHEP 2006), Moscow, Russia "*Study of recently observed mesonic charm states with the BaBar experiment and possible observation of new states*"
- c17 Aug 04 32nd International Conference on High Energy Physics (ICHEP 2004), Beijing, China "*Vub Measurements with the BaBar Detector*"
- c16 Mar 03 XXXVIIIth Rencontres de Moriond, ElectroWeak Interactions and Unified Theories. "*Vub, Vcb and mixing from Babar*"

Lectures at schools and educational seminars

- 15 Oct 15 Incontri di Fisica, Frascati, "Searches for New Heavy Resonances at the LHC"
- 14 Feb 15 Scuola Normale di Pisa, Lecture for PhD students, "Searches for New Heavy Resonances at the LHC"
- 13 Feb 15 International Masterclass on Particle Physics, "Measuring particles at LHC"
- 12 Feb 14 International Masterclass on Particle Physics, "Measuring particles at LHC"
- 11 Jun 07 "Seminars on Software for Nuclear, Subnuclear and Applied Physics", Alghero "*Software and data analysis in High Energy Physics experiments*"

Main Seminars

- cs17 Feb 15 Scuola Normale di Pisa, Seminar "Searches for New Heavy Resonances at the LHC"
- cs16 Dec 13 Electroweak Symmetry Breaking, Flavour and Dark matter after the Higgs discovery "*Status and perspectives of Higgs Physics at LHC*"
- cs15 Sep 12 Electroweak Symmetry Breaking, Flavour and Dark Matter: One Solution for Three Mysteries (DaMeSyFla) Workshop "*Experimental review on the Higgs*"
- cs14 Jul 12 Universita` di Roma, Sapienza "*Observation of a new boson with a mass at 125GeV*"

- cs13 May 12 Frascati, workshop on the Higgs search " $H \rightarrow \gamma\gamma$ "
- cs12 May 08 Riunione commissione Scientifica Gruppo 1 INFN, Ferrara. Seminar "*CMS Preparation for Discovery: mSUGRA, GMSB, and Heavy Stable Particles*"
- cs11 Jan 05 Universita` di Roma "La Sapienza". Seminar INFN "*B Beam Physics with the Babar experiment*"
- cs10 Dec 03 Vxb workshop. SLAC. Seminar "Introduction to session: " $b \rightarrow ulv, b \rightarrow s\gamma$ inclusive"
- cs9 Apr 03 University of California, San Diego. Seminar "*Vub on the recoil from Babar*"
- cs8 May 03 Universita` di Roma "La Sapienza". Seminar INFN "*Vub from Babar*"
- cs7 Apr 03 Universita` di Roma III. Seminar "*Misura di Vub con l'esperimento BaBar*"
- cs6 Dec 02 Vxb workshop. SLAC. Seminar " $b \rightarrow ulv$: *hadronic recoil mass method*"
- cs5 Oct 02 Universita` di Roma "La Sapienza". Seminar INFN "*BaBar: Fisica del B con $100fb^{-1}$.*"
- cs4 Sep 02 Societa` Italiana di Fisica. Alghero. Seminar "*Studio del rapporto di decadimento semileptonico inclusivo del mesone B in stati senza il quark charm e misura dell'elemento di matrice CKM Vub.*"
- cs3 Apr 02 American Physical Society. Albuquerque. 4 seminars "*A Precise Measurement of B Meson Lifetimes with Inclusive Dilepton Events*", "*Measurement of the $B0B0$ Oscillation Frequency with Inclusive Dilepton Events*", "*Measurement of the Fraction of Charmless Semileptonic Decays of B Mesons and the Determination of Vub/Vcb* ", "*Reconstruction of Hadronic B Meson Decays*"
- cs2 Dec 01 Vxb workshop. SLAC. Seminar "*Vub from fully reconstructed B samples*"
- cs1 Apr 01 American Physical Society. Washington. Seminar "*Two Body Charmless Hadronic B Decays: $B \rightarrow K0h, h+\pi0$* "

Proceedings

- pr6 D. del Re, *Timing performance of the CMS ECAL and prospects for the future*, Proceedings of the 16th International conference on calorimetry in high energy physics (CALOR), Giessen
- pr5 D. del Re, *A Search For The Higgs Boson In The Channel $H \rightarrow \gamma\gamma$ With The CMS Detector*. Proceeding of the conference EPS-HEP 2011, International Europhysics Conference on High Energy Physics.
- pr4 D. del Re, *Search for GMSB and for high-ET di-lepton pair events at the LHC*, Proceeding of the XLIIIth Rencontres de Moriond, QCD conference.
- pr3 D. del Re, *Study of recently observed mesonic charm states with the BaBar experiment and possible observation of new states*. Proceedings of 33rd International Conference on High-Energy Physics (ICHEP 06), Moscow, Aug 2006
- pr2 D. del Re, *Study of inclusive and exclusive $B \rightarrow XuLv$ decays and measurement of $|Vub|$ with the BaBar detector*. Proceedings of 32nd International Conference

on High-Energy Physics (ICHEP 04), Beijing, China, 16-22 Aug 2004

- pr1 D. del Re, *Recent results on $|V_{ub}|$, $|V_{cb}|$ and mixing from BaBar* SLAC-PUB-9922, BABAR-PROC-03-011, Jun 2003. Published in the proceedings of 38th Rencontres de Moriond on Electroweak Interactions and Unified Theories, Les Arcs, France, 15-22 Mar 2003. e-Print Archive: hep-ex/0306026
- pr0 J. Hewett et al., *"The discovery potential of a Super B Factory. Proceedings, SLAC Workshops, Stanford, USA, 2003,"* arXiv:hep-ph/0503261.

Student Supervision and tutoring

PhD

2003-2006	A. D'Orazio (just tutoring)	<i>"Measurement of the CKM matrix element V_{ub} studying Exclusive Semileptonic Decays on the Recoil of Fully Reconstructed B's with the BaBar detector"</i>
2004-2007	F. Santanastasio (supervisor)	<i>"Search for Supersymmetry Gauge-Mediated Breaking using high energy photons at CMS experiment"</i>
2007-2010	D. Franci (supervisor)	<i>"Search for SUSY events with off-time photons "</i>
2008-2011	F. Pandolfi (supervisor)	<i>"Search for a Standard Model Higgs Boson in the $H \rightarrow ZZ \rightarrow llqq$ Channel at CMS"</i>
2009-2012	M. Grassi (supervisor)	<i>"Measurement of the Standard Model Higgs Boson Couplings by Means of an Exclusive Analysis of its Diphoton Decay Channel"</i>
2012-2014	L. Soffi (supervisor)	<i>"Search for new physics in the final states with two photons"</i>
2012-2015	L. Pernie' (supervisor)	<i>"Measurement of the Z boson pair-production cross section in proton-proton collisions at 7 and 8 TeV, and ECAL timing studies for the phase-2 upgrade of the CMS experiment"</i>
2014-2017	S. Gelli (supervisor)	<i>ongoing</i>

Undergrad (Laurea Specialistica)

2007	D. Franci (supervisor)	<i>"Algoritmi di identificazione di fotoni e pioni neutri con il calorimetro elettromagnetico di CMS"</i>
2011	C. Fanelli (supervisor)	<i>"Exclusive search for a Fermiophobic Higgs at CMS"</i>
2011	L. Soffi (supervisor)	<i>"Ricerca di supersimmetria in eventi con grande energia mancante e fotoni energetici ad LHC"</i>
2011	L. Pernie' (supervisor)	<i>"Ricerca del bosone di Higgs nel canale $H \rightarrow WW \rightarrow l\nu jj$ all'esperimento CMS"</i>
2012	C. Pistone (supervisor)	<i>"Study of the timing reconstruction with the CMS Electromagnetic Calorimeter"</i>
2013	F. Gizzarelli (supervisor)	<i>"Ricerca di nuove risonanze a vita media lunga che decadono in Jet ad LHC"</i>

I have also supervised about 8 Lauree triennali.

CMS and LHC related publications quoted in the CV

- p37 L. Brianza et al., "Response of microchannel plates to single particles and to electromagnetic showers", Nucl.Instrum.Meth. A797 (2015) 216-221
- p36 V.Khachatryan et al. [CMS Collaboration], "Search for Narrow Resonances Decaying to Dijets in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV", PRL 116, 071801 (2016)
- p35 V.Khachatryan et al. [CMS Collaboration], "Search for dark matter, extra dimensions, and unparticles in monojet events in proton-proton collisions at $\sqrt{s}=8$ TeV", Eur. Phys. J. C (2015) 75:235
- p34 V.Khachatryan et al. [CMS Collaboration], "Search for diphoton resonances in the mass range from 150 to 850 GeV in pp collisions at $\sqrt{s} = 8$ TeV", Physics Letters B 750 (2015) 494–519
- p33 S. Chatrchyan et al. [CMS Collaboration], "Searches for long-lived charged particles in pp collisions at $\sqrt{s} = 7$ and 8 TeV", JHEP 07(2013) 122
- p32 V.Khachatryan et al. [CMS Collaboration], "Observation of the diphoton decay of the Higgs boson and measurement of its properties", Eur. Phys. J. C 74, no. 10, 3076 (2014)
- p31 S.Chatrchyan et al. [CMS Collaboration], "Search for long-lived particles that decay into final states containing two electrons or two muons in proton-proton collisions at $\sqrt{s} = 8$ TeV", submitted to Phys. Rev. D
- p30 S.Chatrchyan et al. [CMS Collaboration], "Search for long-lived neutral particles decaying to quark-antiquark pairs in proton-proton collisions at $\sqrt{s} = 8$ TeV", submitted to Phys. Rev. D
- p29 S.Chatrchyan et al. [CMS Collaboration], "Search for disappearing tracks in proton-proton collisions at $\sqrt{s} = 8$ TeV", submitted to Phys. Rev. D
- p28 S.Chatrchyan et al. [CMS Collaboration], "Measurement of the ratio of inclusive jet cross sections using the anti- k_T algorithm with radius parameters $R=0.5$ and 0.7 in pp collisions at $\sqrt{s}=7$ TeV," Phys. Rev. D 90, no. 7, 072006 (2014)
- p27 S. Heinemeyer et al. [LHC Higgs Cross Section Working Group Collaboration], "Handbook of LHC Higgs Cross Sections: 3. Higgs Properties," , CERN Yellow Report, arXiv:1307.1347 [hep-ph], DOI 10.5170/CERN-2013-004
- p26 S. Chatrchyan et al. [CMS Collaboration], "Search for long-lived particles in events with photons and missing energy in proton-proton collisions at $\sqrt{s}=7$ TeV" Phys.Lett. B722 (2013) 273-294.
- p26bis S. Chatrchyan et al. [CMS Collaboration], "A New Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider", Science 338, 1569 (2012).
- p25 D. del Re, A. Azatov, R. Contino, J. Galloway, M. Grassi and S. Rahatlou, "Determining Higgs couplings with a model-independent analysis of $h \rightarrow \gamma\gamma$." JHEP 1206 (2012) 134.
- p24 S. Chatrchyan et al. [CMS Collaboration], "Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC," Phys.Lett. B716 (2012) 30-61.
- p23 S. Chatrchyan et al. [CMS Collaboration], "Search for the standard model Higgs boson decaying into two photons in pp collisions at $\sqrt{s}=7$ TeV". Phys.Lett. B710 (2012) 403-425

- p23bis S. Chatrchyan et al. [CMS Collaboration], “*Combined results of searches for the standard model Higgs boson in pp collisions at $\sqrt{s}=7\text{TeV}$* ”, Phys.Lett. B 710 (2012) 26
- p22 S. Chatrchyan et al. [CMS Collaboration], “*Search for a fermiophobic Higgs boson in pp collisions at $\sqrt{7}$ TeV.*” JHEP 1209 (2012) 111.
- p22bis S. Chatrchyan et al. [CMS Collaboration], “*Search for Dark Matter and Large Extra Dimensions in pp Collisions Yielding a Photon and Missing Transverse Energy*”, Phys.Rev.Lett. 108 261803 (2012)
- p21 S. Chatrchyan et al. [CMS Collaboration], “*Search for a Higgs boson in the decay channel H to ZZ^* to $q \bar{q} l l$ in pp collisions at $\sqrt{s} = 7 \text{ TeV}$.*” JHEP 1204 (2012) 036
- p20 D. del Re, “*News from the LHC*”, Nuovo Cimento, online version, DOI: 10.1393/ncc/i2012-11300-0
- p20bis S. Chatrchyan et al. [CMS Collaboration], “*Search for Supersymmetry at the LHC in Events with Jets and Missing Transverse Energy*”, Phys. Rev. Lett. 107, 221804 (2011)
- p19 CMS Collaboration “*Determination of Jet Energy Calibration and Transverse Momentum Resolution in CMS,*” JINST 6, P11002 (2011).
- p18 CMS Collaboration “*Missing transverse energy performance of the CMS detector,*” JINST 6, P09001 (2011).
- p18bis V.Khachatryan et al. [CMS Collaboration], “*Search for Dijet Resonances in 7 TeV pp Collisions at CMS*”, Phys. Rev. Lett. 105, 211801 (2010)
- p17 CMS Collaboration “*Time Reconstruction and Performance of the CMS Electromagnetic Calorimeter*” JINST 5, T03011 (2010).
- p16 CMS Collaboration “*Identification and Filtering of Uncharacteristic Noise in the CMS Hadron Calorimeter*” JINST 5, T03014 (2010).
- p15 D. del Re and A.Ventura, “*Beyond Standard Model and Exotics: Experimental Overview*” Nuovo Cimento 123 B, N 3-4, 517-522 (2008).
- p14 P. Adzic et al. [CMS Electromagnetic Calorimeter Group], “*Intercalibration of the barrel electromagnetic calorimeter of the CMS experiment at start-up*”, JINST 3, P10007 (2008).
- p14bis S. Chatrchyan et al. [CMS Collaboration], “*The CMS experiment at the CERN LHC*”, JINST 3, S08004 (2008).
- p13 A. Bartoloni et al., “*High voltage system for the CMS electromagnetic calorimeter,*” Nucl. Instrum. Meth. A 582, 462 (2007).
- p12 P. Adzic et al., “*Energy resolution of the barrel of the CMS electromagnetic calorimeter,*” JINST 2, P04004 (2007).

CMS internal notes (most significant)

- cms23 CMS AN-2014/006 “*Studies on a precision timing electromagnetic calorimeter for the CMS upgrade*” D. del Re, P. Meridiani, L. Pernie’
- cms22 CMS AN-2013/232 “*Search for an Higgs Like resonance in the di-photon mass spectra above 150 GeV with 8 TeV data*” D. del Re, P. Meridiani, S. Rahatlou, C. Rovelli, L. Soffi

- cms22 CMS AN-2011/081 “Search for Long-Lived Particles using Displaced Photons in Proton-Proton Collisions at $\sqrt{s} = 7 \text{ TeV}$ ” D. Del Re, Sh. Rahatlou, M. Sigamani, L. Soffi
- cms21 CMS AN-2012/486 “Study of timing reconstruction with photons” D. del Re, C. Pistone, L. Soffi
- cms20 CMS AN-2012/446 “Exclusive Analysis of Higgs to Diphotons Produced in Association with Electroweak Vector Bosons Decaying to Hadrons at $\sqrt{s} = 8 \text{ TeV}$ ”, F. Pandolfi, A. Marini, D. del Re, F. Micheli, P. Meridiani
- cms19 CMS AN-2012/208 “Search for Higgs boson in the diphoton channel with associated high transverse missing energy”, P. Meridiani, C. Rovelli, D. del Re, M. Grassi, F. Stoeckli, M. Touch, I. Topsis, A. Kyriakis
- cms18 CMS AN-2012/004 “Search for a Standard Model Higgs boson in the decay channel $H \rightarrow WW \rightarrow l\nu jj$ ”, D. del Re, G. Organtini, L. Pernie’
- cms17 CMS AN-2011/401 “Vector Boson Fusion Higgs Extraction Using Forward Jets in the DiPhoton Decay Channel”, C. Palmer, J. Branson, M. Pieri, M. Sani, A. Holzner, D. del Re, P. Meridiani
- cms16 CMS AN-2011/391 “Exclusive search for the Higgs boson in $\gamma\gamma$ final state”, D. del Re, C. Fanelli, P. Meridiani, S. Rahatlou
- cms15 CMS AN-2011/215 “Quark-Gluon Jet Discrimination through Particle Flow Jet Structure”, A. C. Marini, F. Pandolfi, D. del Re. M. Voutilainen
- cms14 CMS AN-2011/206 “Search for a Higgs boson decaying into two photons in proton-proton collisions recorded by the CMS detector at the LHC”, D. del Re, et al.
- cms13 CMS AN-2011/100 “Search for a SM Higgs or BSM Boson $H \rightarrow ZZ \rightarrow (l-l+)(q-q)$ ”, S. Bolognesi, A. Bonato, D. del Re, A.V. Griksan, M. Mannelli, M. Mozer, F. Pandolfi, N.V. Tran, A. Whitbeck
- cms12 CMS AN-2010/304 “Absolute jet energy correction uncertainty”, D. del Re, F. Pandolfi, M. Voutilainen, S. Sengupta, R. Eusebi, M. Kaya, O. Kaya, P. Schieferdecker
- cms11 CMS AN-2010/218 “Particle Flow jet calibration with γ +jet events: p_T balance and missing-ET projection fraction”, D. del Re, F. Pandolfi, M. Voutilaine
- cms10 CMS AN-2010/212 “An algorithm for the determination of the flight path of long-lived particles decaying into photons”, D. del Re, S. Rahatlou, D. Franci
- cms9 CMS AN-2010/141 “Jet Response and Resolution Measurement with Photon+Jet Events at 7 TeV”, D. del Re, F. Pandolfi, M. Voutilainen
- cms8 CMS AN-2010/052 “Observation oh the $\pi^0 \rightarrow \gamma\gamma(\rightarrow e+e-)$ signal in first LHC data”, D. del Re, P. Meridiani
- cms7 CMS AN-2010/005 “Particle Flow Jet Composition”, D. del Re, F. Pandolfi, M. Voutilainen
- cms6 CMS DN-2009/007 “Online Selection of $\pi^0 \rightarrow \gamma\gamma$ Decays and Performance of the InterCalibration Method at the LHC Startup”, D. del Re et al.
- cms5 CMS AN-2009/001 “Understanding Missing Transverse Energy in Di-Photon Events for Exotica Searches”, A. Askew, Y. Gershtein, G. Hanson, R. Stringer, B. Heyburn, U. Nauenberg, S. Zang, D. del Re, S. Rahatlou, M. Balazs, B. Cox
- cms4 CMS AN-2007/040 “Search for Gauge-mediated breaking SUSY with

photons”, F. Santanastasio, Sh. Rahatlou, D. del Re, B. Heyburn, S. L.Zang, R. Stringer, M. Balazs, B. Cox, B. Hirosky

cms3 CMS NOTE-2007/007 “*Intercalibration of the CMS Electromagnetic Calorimeter Using $\pi^0 \rightarrow \gamma\gamma$ Decays from 2006 Test Beams*”, M. Gataullin, V. Litvin, Y. Ma, H. Newman, Y. Yang, R.Y. Zhu, D. del Re

cms2 CMS NOTE-2007/009, “*High Voltage System for the CMS Electromagnetic Calorimeter*”, A. Bartoloni, L.M. Barone, F. Cavallari, I. Dafinei, D. del Re, M. Diemoz, S. Guerra, E. Longo, P. Meridiani, G. Organtini, A. Palma, R. Paramatti, F. Pellegrino, S. Rahatlou, C. Rovelli, F. Santanastasio

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p10bis B. Aubert et al. [BABAR Collaboration], “*Measurement of Cabibbo-Kobayashi-Maskawa angle gamma in $B^{+/-} \rightarrow D^{(*)} K^{+/-}$ decays with a Dalitz analysis of $D \rightarrow K^0_S \pi^+ \pi^-$,*” Phys. Rev. Lett. 95, 121802 (2005)

p9 B. Aubert et al. [BABAR Collaboration], “*Measurement of the inclusive charmless semileptonic branching ratio of B mesons and determination of $|V_{ub}|$,*” Phys. Rev. Lett. 92, 071802 (2004).

p8 B. Aubert et al. [BABAR Collaboration], “*Measurement of the absolute branching fractions $B \rightarrow D \pi, D^* \pi, D^{**} \pi$ with a missing mass method,*” Phys. Rev. D 74, 111102 (2006).

p7 B. Aubert et al. [BABAR Collaboration], “*Study of inclusive B^- and anti- B^0 decays to flavor-tagged $D, D/s$ and Λ_{c^+} ,*” Phys. Rev. D 75, 072002 (2007).

p6 B. Aubert et al. [BABAR Collaboration], “*Measurement of the branching fractions for inclusive B^- and B^0 decays to flavor-tagged D, D_s and Λ_c ,*” Phys. Rev. D 70, 091106 (2004).

p5 B. Aubert et al. [BABAR collaboration], “*Measurement of the $B^0 - \bar{B}^0$ oscillation frequency with inclusive dilepton events,*” Phys. Rev. Lett. 88, 221803 (2002).

p4 B. Aubert et al. [BABAR Collaboration], “*Measurement of branching fractions and search for CP-violating charge asymmetries in charmless two-body B decays into pions and kaons,*” Phys. Rev. Lett. 87, 151802 (2001).

p3 F. Anulli et al., “*Performance of 2nd generation BaBar resistive plate chambers,*” Nucl. Instrum. Meth. A 552, 276 (2005).

p2 F. Anulli et al., “*BaBar forward endcap upgrade,*” Nucl. Instrum. Meth. A 539, 155 (2005).

p1 B. Aubert et al. [BABAR Collaboration], “*The BaBar detector,*” Nucl. Instrum. Meth. A 479, 1 (2002)

Details of research activity

I am an experimental high energy physicist. Since 2006 I am a member of CMS, one of the four experiments running at the LHC. I work on detector calibration and on physics analysis, searching for physics beyond the Standard Model and for the Higgs boson. From 1998 to 2007 I have been a member of BaBar, the experiment at the B-factory PEP-II at SLAC (Stanford, USA). My activity concentrated on the measurement of the Standard Model parameters and on the study of B decays.

My **work in CMS** has been mainly devoted to five main topics:

Analysis of beyond the Standard Model physics signatures in photons

I have been working on search of new physics in the Gauge-mediated Supersymmetry Breaking scenario, where the lightest supersymmetric particle is the gravitino, which is a good candidate for Dark Matter. I studied the case where the second lightest supersymmetric particle is the neutralino, which decays in a gravitino and a photon. The signature is represented by a high momentum photon and large missing transverse energy [cms4, cms10, cms27]. The presence of these particles is determined by using the timing measured by the electromagnetic calorimeter of CMS. This is because the photon from the neutralino is not produced at the beamspot and, in average, hits the calorimeter with $O(1 \text{ ns})$ delay. A paper describing the result of these studies is now public [p26]. Because of my experience in this kind of signatures in January 2013 I have been appointed as the convener of the CMS Exotica Long-Lived Particles analysis subgroup. Later on, in September 2014, I have been appointed as the convener of the CMS Exotica analysis group. This is the largest physics group in CMS, with hundreds of members. The topics covered by this group include all possible non-SUSY new physics searches done in the experiment. Just to give few examples, all high mass ($>1\text{TeV}$) resonance searches in dijets, diphotons, dileptons and all dark matter mono-object searches (monojet, monophoton) are performed in this group. This group produced more than 110 papers in total and about 30 papers and almost 50 preliminary results during my convenership (e.g. [p35, p36], full list in [o13]). Thanks to my experience I have been invited to convene the Exotics session at the LHCP conference in 2015 [o12] and to give a talk on the status of these searches at the LHC at the Societa' Italiana di Fisica (SIF) meeting [c27]. I have also organized two CMS Exotica workshops [o8, o11], attended by about 80 people.

Studies for fast-timing detector for the CMS upgrade

Future high-energy colliders will provide instantaneous luminosities exceeding $10^{34} \text{ cm}^{-2}\text{s}^{-1}$ and the high rate of interactions and the large number of simultaneous collisions in each interaction will be a major challenge. During the high-luminosity operation of the LHC, about 140 concurrent interactions per-bunch collision are expected. While one collision contains the rare signatures of interest for discoveries or precision measurements, the contribution of the remaining interactions must be reduced. About one third of the particle flux originating from high energy hadron collisions is detected as photons. I am working on the development of a detector element based on micro-channel plates (MCP) to sample the ionizing component of electromagnetic showers. The high resolution of MCPs exceeds by far the performance of all previously used detector elements for calorimetry measurements, which could improve significantly in the event reconstruction of events at high luminosity. I am also working on simulation studies, describing how timing information with a precision of a few tens of pico seconds can improve the reconstruction of the physics events under challenging conditions. I plan to demonstrate that such a detector, inserted in the forward region of the electromagnetic calorimeter of the CMS detector at High Luminosity LHC, can significantly reduce the impact of simultaneous interactions in reconstruction and identification of photons, jets, and missing transverse energy [c26, cms23]. To perform these studies, I obtained a university grant (Fondi d'Ateneo) corresponding to 50K euros. This activity

produced a publication [p37] and more are in preparation.

Analysis of the Higgs boson

I have been working on the search of the Higgs boson in several decay channels. The study of the diphoton decay mode of the Higgs represented a very important contribution for the discovery of the new boson at 125 GeV [p24, p26bis], since it gave the largest significance (4 sigma). I was deeply involved in both the inclusive and exclusive analyses [p23, p32]. In the latter, the requirements of two forward jets allows to both identify a specific Higgs production mode (vector boson fusion) and isolate events with a better signal over background ratio. The addition of this channel increases the sensitivity of the measurement and it is very important for the determination of the Higgs couplings to fermions and vector bosons. It also allowed to put stronger constraints on the existence of a fermiophobic Higgs [p22]. Thanks to my experience in Higgs analysis with jets I have been appointed as the convener of the "Jets" subgroup of the LHC Higgs Cross Section Working Group [o7]. The activity of this group is summarized in the CERN Yellow Report on Higgs [p27]. I also worked on the addition of another exclusive channel where the signature is represented by two photons and missing transverse energy. The goal is to select Higgs decays produced via the associated production mode, where the final state includes a W or a Z decaying in neutrinos [cms19, cms20]. These studies have been included in the Higgs to diphoton run1 legacy publication [p32]. I have also worked in collaboration with theorists. The aim was the Higgs couplings extraction using exclusive Higgs channels [p25]. I have also extended the diphoton search to larger invariant masses ($>150\text{GeV}$) [cms22] and this analysis is now close to publication.

I worked on the analysis of the Higgs decays to two vector bosons (ZZ, WW) [p21], where one decays to leptons and the other one to jets. The advantage of these channels is represented by the larger cross section (about 10 times for ZZ and 5 times for WW) compared to the traditional four lepton channels. However, the drawback is the presence of jets in the final state, which induces large backgrounds and poor energy resolution. To increase the sensitivity, kinematic fits are used. In addition, a detailed study of the jet constituents and jet shape allows to discriminate between jets produced by quarks and gluons [cms15]. Thanks to these techniques, the analyses contributed in a significant manner to the exclusion of the Higgs at high masses ($M_H > 250\text{GeV}$) and these results have been included in the 7 TeV paper where all Higgs channels have been combined [p23bis].

Work on jets

High momentum jets are present in almost every collision selected at the LHC and they are used in many analyses. Given that they are reconstructed using the energy deposited in the calorimeters, their energy calibration is not trivial. My work has been devoted to the extraction of the energy corrections using control samples of data, like gamma+jets events. Thanks to my experience on this topic, in 2010 I have been appointed as the convener of the JetMET working group, that is responsible for the reconstruction and the commissioning of jets and missing transverse energy (MET). This group has about 100 members. It produced several CMS public notes and two papers [p18,p19]. The calibration and the commissioning of jets and MET have been crucial for the earliest CMS searches for new physics [p18bis, p20bis, p22bis]. I worked also on analysis tools, which exploit the jet composition (particle type, number of particles, jet shapes) and are aimed to discriminate between jets originated by quarks and gluons or to reject jets coming from extra interactions (pile-up) [cms15].

Work on the electromagnetic calorimeter (ECAL).

Since I joined the collaboration in 2006 I have been always involved in the maintenance, commissioning and calibration of the ECAL. First of all, I have been contributing to the maintenance of the high voltage system of the barrel sector of the ECAL [p13, p14bis]. I also worked on the calibration of the ECAL by using electrons and neutral pions produced at the testbeams, which took place at Cern in 2006 and 2007, H2 and H4 [p14, p16] and with the first collisions data [cms8]. More recently, I studied the time measurement of the ECAL,

crucial for the identification of off-time new physics signatures and for the rejection of the backgrounds, which come from additional pp interactions. Using samples of cosmic rays muons, testbeam electrons and beam splash events, the performance of the time measurement and intercalibration of the ECAL crystals have been determined [p17, cms21].

My **work in BaBar** has been mainly devoted to five main topics:

Measurement of the CKM parameter $|V_{ub}|$.

The measurement of the $|V_{ub}|$ parameter is crucial since it allows to put constraints on the unitary plane in order to verify the validity of the Standard Model. I studied charmless semileptonic B decays to extract this parameter [o2]. The smallness of $|V_{ub}|$ makes the measurement very complicated because of the tiny branching ratio compared to the one of the overwhelming background represented by charm decays. Both inclusive and exclusive decays have been used. The measurement was based on the so-called “recoil” technique, where one of the two B mesons from the $Y(4S)$ decay is fully reconstructed in hadronic modes. This analysis has been presented at several conferences [c18, c19] and produced two published papers [p9, p10]. They represent the first publication in B physics with this novel technique and set the reference for the following $|V_{ub}|$ measurements.

Analysis of the B decays in fully hadronic modes

The reconstruction of B decays in fully hadronic modes is crucial at the B factories. Several parameters can be measured with the study of these decays, from the CKM parameters $\sin(2\beta+\gamma)$ and angle γ , to the study of Heavy Quarks and the search for new resonances and exotics. My work on these decays produced a paper [p11, c17] where, with a novel approach, several $B \rightarrow D^{(*)}D_{sJ}^{(*)}$ branching ratios have been extracted. In addition, the branching ratios of the new state $D_{sJ}(2460)$ discovered in 2004 have been measured for the first time.

Thanks to the experience in this kind of physics I have been nominated as the convener of the BaBar group that studies the exclusive hadronic B meson decays in final states with charm ($B \rightarrow DX$). This group was the largest one in the BaBar experiment, with about 70 physicists. During my convenership, this group produced 20 journal publications, e.g. [p10bis].

Work on recoil physics

I am the author of the so-called “semiexclusive reconstruction”. This algorithm is able to reconstruct hadronic B decays, with up to 10 particles in the final state, high efficiency and fast computation. It was originally created for the $|V_{ub}|$ analysis but, later, it was adopted by several analyses in BaBar, like the measurement of the $B \rightarrow \tau \nu$ branching ratio. There are about 15 published papers, which made use of it. I have been also nominated as the coordinator of the “Recoil Forum” group, whose main charge was to discuss and coordinate the strategies and tool implementations that are in common among the analyses performed on the recoil of reconstructed B mesons.

Measurement of the mixing parameter Δm_d

The B^0 - B^0 bar mixing was measured by studying the high statistics sample of events with two charged leptons in the final states [p5, cs3]. This information is extracted from the time dependent study of the distance between the two B meson decay vertexes and their charge correlation. At the time of the publication it provided the most precise determination of the parameter Δm_d .

Work on the BaBar drift chamber

I have been the main responsible for the monitoring of the drift chamber of the experiment [p1, o1]. I implemented the code for the monitoring of both the online (raw) and offline (reconstructed) physics quantities. I have actively participated to the commissioning period in

the years 1998-2000 when the cosmics runs and first collisions took place.

Web references

- [o13] CMS Exotica public results
<https://twiki.cern.ch/twiki/bin/view/CMSPublic/PhysicsResultsEXO>
- [o12] LHCP conference, "Exotics" sessions 1,2 and 3:
<https://indico.cern.ch/event/389531/timetable/#all/>
- [o11] CMS Exotica workshop, Venezia:
http://web.infn.it/cms_padova/index.php/cms-exotica-workshop/
- [o10] Web page with job positions
<http://server2.phys.uniroma1.it/DipWeb/PostDoc/mainPD.html>
- [o9] Scientific Report of Physics Department, Sapienza, years 2007-2009
https://www.phys.uniroma1.it/fisica/sites/default/files/allegati/Scientific_Report07-09.pdf
- [o8] CMS Exotica workshop, Madrid:
<http://wwwae.ciemat.es/exo2014/>
- [o7] "*LHC Higgs Cross Section Working Group*",
<https://twiki.cern.ch/twiki/bin/view/LHCPhysics/CrossSections>
- [o6] CKM 2005: Third Workshop on the Unitarity Triangle:
<http://ckm2005.ucsd.edu/>
- [o5] Second Workshop on the Discovery of the Potential of an Asymmetric B Factory at 1036 Luminosity
<http://www.slac.stanford.edu/BFROOT/www/Organization/1036StudyGroup/0310Workshop/>
- [o4] First Workshop on the Discovery of the Potential of an Asymmetric B Factory at 1036 Luminosity:
<http://www.slac.stanford.edu/BFROOT/www/Organization/1036StudyGroup/0303Workshop/>
- [o3] Vxb workshop
<http://www.slac.stanford.edu/BFROOT/www/Public/Organization/2003/workshops/vxbwksp2003/index.html>
- [o2] Tesi dottorato "*Measurement of $|V_{ub}|$ studying inclusive semileptonic decays on the recoil of fully reconstructed B 's with the BaBar experiment*":
<http://www.infn.it/thesis/PS/getfile.php?filename=293-Del%20Re-dottorato.ps>
- [o1] Tesi laurea "*La camera a deriva di BaBar: analisi in linea dei parametri di funzionamento*": <http://www.infn.it/thesis/PS/getfile.php?filename=292-Del%20Re-laurea.ps>

Curriculum Vitae of Cecilia Voena

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Nationality: Italian
Date of birth: 21/08/1975

Current / past positions

2009- Staff researcher INFN Roma (level III, **current position**)
2005-2009 Researcher at INFN Roma (art.23 by national selection 1N/R3/SUB)
2003-2005 Post-Doc at INFN Roma. Research topic: "Measurement of the angle γ at Babar"
Note: maternity leave for 5 months in both 2004 and 2006

Education

Jan 2003 **Ph.D. in Physics** at Sapienza Università di Roma. Thesis: "CP violating asymmetries in B into $D^*\pi$ decays with the Babar experiment". Supervisor: Prof. F. Ferroni
July 1999 **Master Degree** ("vecchio ordinamento") **in Physics** with 110/110 cum laude. Thesis: "Fast Monitoring system for the Babar drift chamber". Supervisors: Prof. F. Ferroni, Dr S. Morganti
July 1994 Diploma Liceo Classico (Tito Lucrezio Caro, Roma) with 60/60

Awards/fellowships

Sep 2009 **Prize "Ettore Pancini"** given by the SIF (Italian Physics Society) for the relevant contribution given to the Babar experiment
1999 Fellowship for "laurea thesis" abroad, given by the Sapienza Università di Roma
1997 Fellowship for "collaboration" with the Laboratory of Electronics at the Department of Physics (Sapienza Università di Roma)

Official roles at INFN

2012-on going MEG Rome group coordinator
2016-on going Member of the examination board for post-doc positions at INFN Roma
2012 Member of the examination board for the assignment of the "Conversi Prize" for the best Ph.d thesis in High Energy Physics of the year

Research activity

Note: the references labelled with "pX" (X=number) refer to the full publication list presented together with the application, the references labelled with "cX" refer to the list of the talks at conferences located at the end of this CV

High energy physics at accelerator

1) MEG/MEGII experiment (undergoing activity):

The MEG experiment searches for the charged lepton flavour violating decay $\mu \rightarrow e\gamma$ at the Paul Scherrer Institute. The MEG collaboration set the most stringent limit in the world (4.2×10^{-13} @90% C.L.) with the full data set (collected in the years 2009-2013). The experiment is currently being upgraded (MEGII) to improve the sensitivity by one order of magnitude ($\sim 5 \times 10^{-14}$). An observation of this decay would be an unambiguous sign of Physics beyond the Standard Model, while setting more stringent limits would be useful to constrain New Physics theoretical models.

My roles in the experiment are/were:

- Coordinator of the MEG/MEGII Rome group (since 2012)
- Responsible of the HV system, gas system, wire tension measurement system for the new MEGII drift chamber which is currently under construction. I also participated to the R&D that led to the current design [p4]
- Coordinator of MC production (2010-2013)
- Co-author of the physics analysis (time calibration, bayesian approach) [p1, p2, p18, p24,p43])
- Responsible for the Timing Counter (i.e. the scintillating bars detector) calibration, Timing Counter commissioning (2009-2013) [p17, p26, p28]
- Shift coordination during data taking

I was invited to talk about MEG to various conferences [c2, c3, c4, c6, c7]

2) Babar experiment (1999-2010):

The Babar detector took data in the years 1999-2008 at the high luminosity B-factory PEP-II at the Stanford Linear Accelerator Center. The PEP-II e+e- collider was able to produce B-antiB pairs through the production of the resonance $\Upsilon(4S)$. The Babar experiment studied (and discovered) the CP violation in the B meson system and several B decays (it also studied charm and tau decays).

My roles/activities in the experiment were:

- Coordinator of the $\sin 2\beta$ working group. The angle β is one of the parameters that describe the CP violation in the B meson system. In these years, the systematic error was reduced by a factor 20% and the overall precision on the parameter was lowered to 5% (2006-2007)[p190,p342]
- Coordinator of the flavour tagging working group. The tagging of the B flavour at the moment of the decay is a fundamental ingredient for time-dependent CP and mixing analyses (2005-2007) [p435]
- Babar representative at the Heavy Flavour Averaging Working Group (HFAG) for the B decays to open charm (2004-2009)
- Member of the panel for the coordination of the Physics analysis in Italy (2006-2008)
- Deputy Run Coordinator (2006-2007)
- Primary author of the analyses of the CP violation in the $B \rightarrow D^{(*)}\pi/\rho$ decays, related to the measurement of the $\sin(2\beta+\gamma)$ parameter [p403,p269]
- Primary author of the analyses of the $B \rightarrow D^{(*)s}\pi/\rho$ rare decays. The decay $B \rightarrow D_s\pi$ has been observed for the first time [p425,p258]
- Realization of the system for the quality control during LST production for the muon detector (2003)[p357]
- Production of new RPC for the muon detector (2001-2002)
- Member of "B decays to open charm" working group. I worked on the selection of the B sample used for flavour tagging (2000-2001) [p447]
- Co-author of the B mixing frequency measurement using dilepton events (2000-2001)[p437]
- Development of the drift chamber fast monitoring system, drift chamber commissioning (1999) [p452]

I gave several invited talks on the Babar experiment related to my specific activities [c9, c10, c11, c12, c13, c14, c15, c16, c17, c18, c19, c20, c21, c22, c23, c24]

Medical physics (on-going activity)

Since 2012 I work in the Applied Radiation Physics Group, a group of physicists and bio-engineers from different institutions (INFN, Sapienza Università di Roma) devoted to the study of the applications of particle Physics to medical purposes. I am mostly involved in the study of new dose monitoring detectors to be used during hadron therapeutic treatments of cancer. Currently, the precision of the dose delivery to the patient is limited by the lack of effective techniques to measure the dose during a treatment.

My contributions are:

- Co-author of the measurements of particle fluxes escaping from a PMMA phantom hit by a carbon ion beam at therapeutic energies. The knowledge of these fluxes that come out of the patient is necessary for the design of dose profilers that exploit this radiation [p6, p9, p11, p14, p20].
- Optimization and study of the achievable performances of a dose profiler using simulation in the context of the INSIDE (INovative Solutio...) collaboration. The profiler, made by six scintillating fiber planes and by a small lyso calorimeter, is designed to measure the charged component of the flux escaping the patient during a treatment. The detector is currently under construction and will be tested at CNAO [p6]

I was invited to the conference [c1] to speak about the dose profiler project.

Detector R&D: DREAM experiment (2007-2013)

The DREAM (Dual REAdout Method) collaboration studies the possibility of improving significantly the resolution for hadron calorimeters by measuring the electromagnetic fraction through the detection of the Cerenkov light, produced only by the electromagnetic component of an hadronic shower.

I worked

- Test beam with prototypes (scintillating crystals) at the H8 line at CERN
- Primary author of the paper on the separation of the Cerenkov and the scintillation light in BGO and PWO crystals [p77]
- Co-author of the paper that studied the possibility of separating the Cerenkov and the scintillation light in TeO₂ crystal, finalized to the discrimination of backgrounds in double beta decays experiments [p15, p22]

Publications

454 publications in peer-review journals and several conference papers

Grants

2013 participation to the funded FIRB (italian grant) about "cluster timing" techniques to improve the spatial resolution of drift chamber detectors

2008 participation to the funded PRIN (italian grant) about dual readout calorimeter calorimetry

Teaching

2011 Qualified for assistant professor in the procedure "Abilitazione nazionale tornata 2011", sector 02/A1

2009-on going I am teaching assistant in the laboratory "Laboratory of Nuclear and Subnuclear Physics" at the Physics department, Sapienza Università di Roma

2002-2003 Teaching assistant at "General Physics" for Biologists

2001-2002 Teaching assistant at "General Physics" for Pharmacists

2000-2001 Teaching assistant at "General Physics" for Physicists

Supervision or co-supervision of 7 master degree theses and 1 Phd thesis.

Organization of meetings

2010 Member of the organizing committee of "Incontri della fisica delle alte energie" in Rome

Review activity

2016 Review of projects in the context of the call for "Research projects in physics, mathematics or engineering sciences relating to cancer" by the Cancer ITMO of the French National Alliance for Life and Health science in collaboration with French National Cancer Institute and INSERM

Languages

Italian: mother tongue

English: fluent spoken/written

Talk at international conferences

- c1) 2015 54th International winter meeting on nuclear physics, Bormio, invited talk on **"A novel dual-mode tracking device for online dose monitoring in hadron therapy"**
- c2) 2014 Fourth workshop on flavour symmetries and consequences in accelerators and technology, Brighton, invited talk on **"Results and prospects on MEG experiment"**
- c3) 2013 3rd workshop on the Physics of fundamental symmetries and interactions at low energies and the precision frontier, PSI Villigen, invited talk on **"Searching for the lepton flavour violating decay $\mu \rightarrow e \gamma$ with the MEG experiment: results and perspectives"**
- c4) 2012 The XIth International Conference on Heavy Quarks and Leptons, Praga, invited talk on **"Searches of Lepton flavour violation in muon decays"**
- c5) 2011 Universita di Roma "La Sapienza", Particle Physics seminar on **"Results of the MEG experiment"**
- c6) 2010 Flavor Physics and CP violation 2010, Torino, invited talk on **"Lepton Flavor Violation in $\mu \rightarrow e \gamma$ "**
- c7) 2009 Incontri di Fisica delle Alte Energie, VIII Edizione, Bari, invited talk on **"Status of the MEG experiment"**
- c8) 2008 XIII International Conference on Calorimetry in High Energy Physics, Pavia, invited talk on **"Separation of PbWO4 and BGO signals into Cerenkov and scintillation component"**
- c9) 2008 Les Rencontres de Physique de la Vallee d'Aoste, LaThuile, invited talk on **"Measurement of CKM angles at the B-factories"**.
- c10) 2005 Societa' Italiana di Fisica, Congresso Nazionale 2005, Catania, invited talk on **"CP violation in B decays in charmless final states with the Babar experiment"**
- c11) 2005 HEP2005 International Europhysics Conference on High Energy Physics EPS, Lisboa, invited talk on **"Measurements of $\sin(2\beta+\gamma)$ with BaBar"**
- c12) 2005 3rd Workshop on unitarity triangle, San Diego, invited talk on **" $\sin(2\beta+\gamma)$ constraint from CP asymmetries in B^0 to $D^{(*)}\pi/\rho$ decays"**

- c13) 2005 Secondo incontro sulla Fisica del Beauty, Bari, invited talk on **``Status of the unitary triangle analysis at the B factories''**
- c14) 2003 3rd Meeting of the EuroGDR Supersymmetry, Parigi, invited talk on **``B factory status and perspectives''**
- c15) 2003 Universita' di Roma La Sapienza', Particle Physics seminar on **``The CKM angle γ : recent results and future perspectives with the BaBar detector''**
- c16) 2002 Societa' Italiana di Fisica, Congresso Nazionale 2002, Alghero , talk on **``Measurement of $\sin(2\beta+\gamma)$ with the decays B^0 to $D^{(*)}\pi$ at Babar''**
- c17) 2002 XIV Incontro Fisica delle Alte Energie, Parma, invited talk on **``Measurement of the CKM angle γ at the B factories''**
- c18) 2002 31st International Conference on High Energy Physics, Amsterdam, invited talk on **``Measurement of B^0 mixing with Babar''**
- c19) 2002 American Physical Society, Albuquerque , talk on **``Measurement of branching ratio of B^0 to $D_s\pi$ with BaBar''**
- c20) 2002 American Physical Society, Albuquerque, talk on **``Feasibility study on measurement of $\sin(2\beta+\gamma)$ with the decays B^0 to $D^{(*)}\pi$ at Babar''**
- c21) 2002 American Physical Society, Albuquerque, talk on **``Measurement of CP/T violation with dilepton events with BaBar''**
- c22) 2002 Universita di Roma ``La Sapienza'', Particle Physics seminar on **``Misure di violazione di CP a BaBar''**
- c23) 2002 Universita di Roma ``La Sapienza'', Particle Physics seminar on **``Misure di violazione di CP a BaBar''**
- c24) 2000 Societa Italiana di Fisica, Congresso Nazionale 2000, Palermo , talk on **``Branching ratio measurement of B^0 in charmonium final states at BaBar''**

Curriculum Vitae

Informazioni personali

Cognome/i nome/i

Indirizzo/i

Telefono/i

Email

Nazionalità

Data di nascita

Vignati, Marco

INFN Sezione di Roma, P.le A. Moro 2, 00185 Roma

Ufficio: +39 06-49914832 Mobile: +39 328-9719383

marco.vignati@roma1.infn.it

Italiana

12 Agosto 1980, Roma



Incarico attuale

11/2014–

Primo Ricercatore, Istituto Nazionale di Fisica Nucleare, Sezione di Roma.

Incarichi precedenti

02/2014–10/2014

Ricercatore a tempo determinato (RTD-A), Sapienza Università di Roma.

01/2012–02/2014

Ricercatore a tempo determinato (Art. 23), Sezione di Roma dell'Istituto Nazionale di Fisica Nucleare.

01/2010–12/2011

Assegnista di Ricerca, Dipartimento di Fisica di Sapienza Università di Roma.

11/2006–10/2009

Dottorato di Ricerca in Fisica (XXII ciclo), Sapienza Università di Roma.

02/2006–09/2006

Contratto di collaborazione, Dipartimento di Fisica di Sapienza Università di Roma.

04/2005–12/2005

Contratto di collaborazione, Alef S.R.L.: Simulazioni Monte Carlo e modelli matematici per la finanza della banca e dell'assicurazione.

09/2004–04/2005

Contratto di collaborazione, Nergal S.R.L.: Sviluppo software per il controllo di satelliti.

Titoli

11/2014

Abilitazione scientifica nazionale come professore associato di fisica delle interazioni fondamentali (settore 02/A1).

01/2010

Dottorato di Ricerca in Fisica, Sapienza Università, Roma. Tesi: "Model of the response function of CUORE bolometers".

06/2004

Laurea in Fisica, Sapienza Università di Roma. Tesi: "Misura dell'asimmetria di CP dipendente dal tempo nelle transizioni $b \rightarrow s$ con l'esperimento BaBar".

Finanziamenti individuali

2013

ERC Starting Grant, progetto n. 335359 (Capo progetto): "CALDER - Neutrinoless double-beta decay identification in TeO_2 bolometers with kinetic inductance detectors (KIDs)," *Finanziamento di 1.177.000 Euro*.

2012

Progetto FIRB del Ministero dell'Istruzione dell'Università e della Ricerca n. RBF1269SL (Capo progetto): sviluppo di elettronica e sistemi di acquisizione dati per sensori di tipo KID. *Finanziamento di 783.000 Euro*.

Attività di ricerca


- 2014 – CALDER (Cryogenic wide-Area Light Detectors with Excellent Energy Resolution) R&D nella sezione INFN di Roma [1]. CALDER sviluppa rivelatori di luce per un upgrade di CUORE. I rivelatori sono mediati da fononi e basati su sensori superconduttori di tipo KID. I primi risultati sono già competitivi con alcune delle tecnologie attuali [2]. Guido un gruppo di circa 15 ricercatori (7 dei quali sono post-doc o ricercatori a tempo determinato assunti sui fondi ERC e FIRB) con il quale progettiamo, realizziamo e testiamo i rivelatori.
- 2006 – Esperimento CUORE (Cryogenic Underground Observatory for Rare events) ai Laboratori Nazionali del Gran Sasso. CUORE è un esperimento in costruzione costituito da una tonnellata di rivelatori bolometrici di TeO_2 , che cercherà il neutrino di Majorana tramite il doppio decadimento beta senza emissione di neutrini del ^{130}Te . La collaborazione include circa 100 ricercatori, principalmente italiani e statunitensi. I miei contributi principali a CUORE consistono in:
- 2013 – 2014 Ho sviluppato la maggior parte del software e degli algoritmi di analisi dati per CUORE-0, il prototipo di CUORE. Come membro del Physics Board ho guidato un gruppo di circa 15 ricercatori per analizzare i dati nella fase di commissioning e per la produzione dei risultati con il primo anno di dati [3,4].
- 2012 Ho guidato la ricerca che ha condotto per la prima volta a rivelare la luce Čerenkov emessa da particelle β/γ in bolometri di TeO_2 , introducendo la possibilità di rimuovere il fondo indotto da particelle α in CUORE. Rivelatori di luce di nuova generazione, come quelli sviluppati da CALDER, migliorerebbero la sensibilità dell'esperimento fino a sei volte tanto [5].
- 2011 Ho realizzato un algoritmo di trigger e metodi di analisi dati capaci di abbassare la soglia di energia da decine di keV a pochi keV. Ciò permetterà a CUORE di essere sensibile ad un segnale di modulazione annuale del tasso di conteggi e verificare così il risultato dell'esperimento DAMA nella ricerca di Materia Oscura [6].
- 2010 Ho sviluppato il primo modello termico funzionante dei bolometri di TeO_2 [7] e il primo simulatore di segnale e rumore di bolometri di grande massa. Ho sviluppato un algoritmo per ridurre il rumore sfruttandone la correlazione tra i vari rivelatori [8].
- 2010 – Esperimento LUCIFER/CUPID-0 (Low-background underground installation for elusive rates) ai Laboratori Nazionali del Gran Sasso. La collaborazione, che include circa 20 ricercatori, principalmente italiani e francesi, sviluppa bolometri scintillanti di ZnSe per la ricerca del doppio decadimento beta senza emissione di neutrini del ^{82}Se . Ho coordinato lo sviluppo del software di analisi dati e ho introdotto un algoritmo capace di abbassare la soglia in energia dei rivelatori di luce di un fattore 3 [9].
- 2011 Ho dimostrato che oltre ai nuclei che decadono con emissione di radiazione β , anche i nuclei che decadono per cattura elettronica possono assorbire neutrini relitti del Big Bang. Questo risultato fornisce un'alternativa all'utilizzo di nuclei di ^3H nella ricerca di neutrini relitti, ovvero nuclei di ^{163}Ho [10].

Publicazioni scelte

- [1] E. S. Battistelli *et al.*, "CALDER - Neutrinoless double-beta decay identification in TeO_2 bolometers with kinetic inductance detectors," *Eur. Phys. J. C* **75** (2015) 353, doi:10.1140/epjc/s10052-015-3575-6 - arXiv:1505.01318.
- [2] L. Cardani *et al.*, "Energy resolution and efficiency of phonon-mediated kinetic inductance detectors for light detection," *Appl. Phys. Lett.* **107** (2015) 093508, doi:10.1063/1.4929977 - arXiv:1505.04666.

- [3] C. Alduino *et al.* [CUORE Collaboration], "Analysis Techniques for the Evaluation of the Neutrinoless Double-Beta Decay Lifetime in ^{130}Te with CUORE-0," *Phys. Rev. C* **93** (2016) 045503, doi:10.1103/PhysRevC.93.045503 - arXiv:1601.01334.
- [4] K. Alfonso *et al.* [CUORE Collaboration], "Search for Neutrinoless Double-Beta Decay of ^{130}Te with CUORE-0," *Phys. Rev. Lett.* **115** (2015) 102502, doi:10.1103/PhysRevLett.115.102502 - arXiv:1504.02454.
- [5] J. W. Beeman *et al.*, "Discrimination of α and β/γ interactions in a TeO_2 bolometer," *Astropart. Phys.* **35** (2012) 558, doi:10.1016/j.astropartphys.2011.12.004 - arXiv:1106.6286.
- [6] F. Alessandria, *et al.* [CUORE Collaboration], "The low energy spectrum of TeO_2 bolometers: results and dark matter perspectives for the CUORE-0 and CUORE experiments," *JCAP* **1** (2013) 038, doi:10.1088/1475-7516/2013/01/038 - arXiv:1209.2519.
- [7] M. Vignati, "Model of the response function of large mass bolometric detectors," *J. Appl. Phys.* **108** (2010) 084903, doi:10.1063/1.3498808 - arXiv:1006.4043.
- [8] C. Mancini-Terracciano and M. Vignati, "Noise correlation and decorrelation in arrays of bolometric detectors," *JINST* **7** (2012) P06013, doi:10.1088/1748-0221/7/06/P06013 - arXiv:1203.1782.
- [9] G. Piperno, S. Pirro, M. Vignati, "Optimizing the energy threshold of light detectors coupled to luminescent bolometers," *JINST* **6** (2011) P10005, doi:10.1088/1748-0221/6/10/P10005 - arXiv:1107.5679.
- [10] M. Lusignoli and M. Vignati, "Relic Antineutrino Capture on ^{163}Ho decaying Nuclei," *Phys. Lett. B* **697** (2011) 11, doi:10.1016/j.physletb.2011.01.047 - arXiv:1012.0760.

Produzione scientifica

ORCID	 http://orcid.org/0000-0002-8945-1128
ResearcherID	http://www.researcherid.com/rid/H-1684-2013
Articoli [Scopus]	82 documenti, 948 citazioni, h-index 16.
Libro	M. Vignati, "Model of the Response Function of CUORE Bolometers," Springer Verlag, 1st Edition, 2011, ISBN 978-94-007-1231-7, doi:10.1007/978-94-007-1232-4.
Conferenze	10 presentazioni su invito e 10 su contributo a conferenze internazionali.
Seminari	4 seminari in università nazionali e internazionali.
Divulgazione	2 seminari per studenti di liceo, 1 seminario aperto al pubblico in una libreria e 2 articoli su riviste.

Premi

2013	Borsa "Ettore Pancini" della Società Italiana di Fisica (5000 Euro).
2013	Diploma "Giuseppe Occhialini" della fondazione Ettore Majorana di Erice.
2011	Premio "Springer Thesis" (500 Euro e pubblicazione della tesi di dottorato).

Ruoli di responsabilità

2015 –	Coordinatore dell'infrastruttura software offline di CUORE.
2014 –	Membro dello steering committee dell'esperimento CUPID.
2014 –	Responsabile didattico dei Laboratori di Fisica, Sapienza Università di Roma.

2013 – 2018	Principal Investigator dei progetti ERC e FIRB sopracitati.
2016	Membro del comitato scientifico del “5th workshop on the Physics and Applications of Superconducting Microresonators” .
2015	Membro del comitato di selezione post-doc del Gran Sasso Science Institute.
2008 – 2015	Coordinatore del software di CUORE.
2011 – 2014	Membro del Physics Board di CUORE.
2011 – 2012	Coordinatore dell’analisi dati e del software di LUCIFER.
Referaggio	Journal of Low Temperature Physics.

Didattica

2014 –	Titolare del corso di Laboratorio di Sistemi e Segnali del corso di Laurea in Fisica di Sapienza Università di Roma.
2010 –	Lezioni di analisi dati con C++ e ROOT e supervisione di un’esperienza con rivelatori di Germanio per il corso di Laboratorio di Fisica Nucleare e Subnucleare del corso di Laurea in Fisica dell’Università Sapienza.
2011 – 2013	Esercitazioni per il corso di Laboratorio di Calcolo del corso di Laurea in Fisica dell’Università Sapienza.
2007 – 2008	Esercitazioni per il corso di Fisica del corso di Laurea in Informatica dell’Università Sapienza.
2005	Lezioni sul metodo Monte Carlo applicato alla finanza nel “Master in Finanza della Banca e dell’ Assicurazione”, Sapienza Università di Roma e Capitalia.

Post-doc e studenti

2014 –	Post-doc: L. Cardani, N. Casali, I. Colantoni, Antonio D’Addabbo.
2015	N. Casali, Tesi di Dottorato, Università degli studi dell’Aquila, Relatore esterno.
2015	G. Piperno, Tesi di Dottorato, Sapienza Università di Roma, Relatore.
2012	M. Ottaviani, Tesi triennale, Sapienza, Correlatore.
2011	C. Mancini-Terracciano, Tesi Magistrale, Sapienza, Correlatore.
2011	V. Di Biagio, Tesi Magistrale, Sapienza, Correlatore.

Lingue

Lingua madre	Italiano
Lingue straniere	Inglese (ottimo letto, molto buono parlato e scritto)
	Francese (base)

Il sottoscritto, consapevole che, secondo quanto previsto dall’art.46 del D.P.R. n.445 del 28.12.2000, le dichiarazioni mendaci sono punite ai sensi del codice penale e delle leggi speciali in materia, dichiara che quanto contenuto nel proprio curriculum corrisponde a verità.

Roma, May 28, 2017



Marco Vignati

Fabio Bellini

Curriculum Vitae

Roma, li 29.03.2017

Part I – General Information

Full Name	Fabio Bellini
Date of Birth	02.08.1976
Place of Birth	Rimini
Citizenship	Italian
Permanent Address	Via Folco Portinari 59, 00151 Rome, Italy
Mobile Phone Number	+393297428566
E-mail	fabio.bellini@uniroma1.it , fabio.bellini@roma1.infn.it
Spoken Languages	Italian, English

Part II – Education

Type	Date	Institution	Thesis/Mark
PhD (XVI ciclo)	29.01.2004	Univ. of Rome “Sapienza”	“Measurement of $b \rightarrow s \gamma$ Branching Ratio Studying the Recoil of Fully Reconstructed B's with the BaBar Experiment”
University Graduation	19.07.2000	Univ. of Rome “Roma Tre”	“Misura della Sezione d'urto di rigenerazione di mesoni K neutri di impulso 110 MeV/c” 110/110 cum laude
High School Graduation	1995	Liceo Scientifico “A. Labriola”	60/60 cum laude

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
01.10.2015	today	Univ. of Rome “Sapienza”	Associate Professor
28.11.2014	28.11.2020	MIUR	Abilitazione Nazionale 2013 Prof. II fascia SC02/A1-SSD FIS/01
23.01.2014	23.01.2020	MIUR	Abilitazione Nazionale 2012 Prof. II fascia SC02/A1-SSD FIS/01

30.12.2008	30-09-2015	Univ. of Rome "Sapienza"	Assistant Professor (Ricercatore, confermato dal 30.12.2011)
07.11.2006	06.11.2008	INFN	Grant Holder(Assegno di Ricerca)
01.10.2006	31.10.2006	Univ. of Rome "Tor Vergata"	Contratto di Collaborazione
15.07.2006	30.09.2006	Univ. of Milan "Bicocca"	Contratto di Collaborazione
01.06.2004	31.05.2006	Univ. of Rome "Sapienza"	Grant Holder(Assegno di Ricerca)
02.2004	05.2004	Fondazione Angelo Della Riccia	Grant for research in a foreign laboratory (Stanford Linear Accelerator Center)

IIIA – Other Appointments

Years	Institution	Position
01.01.2010-today	INFN	Incarico di Ricerca
2005	INFN	Idoneità concorso Ricercatore III livello (bando n.10745/2004)
2005	INFN	Idoneità concorso Ricercatore III livello (bando n.10578/2004)

Part IV – Teaching experience

Academic Y.	Institution	Lecture/Course
15/16-16/17	Univ. of Rome "Sapienza"	Course: "Laboratory of Mechanics"
15/16-16/17	Univ. of Rome "Sapienza"	Lectures on Big Bang Nucleosynthesis and Neutrinoless Double Beta Decay search for Nuclear Physics Course
12/13-14/15	Univ. of Rome "Sapienza"	Course: Physics for Chemistry and Pharmaceutical Technology
12/13-16/17	Ass. Insegnamento Fisica	Lectures for Preparation to the Physics Olympics
10/11-14/15	Univ. of Rome "Sapienza"	Lectures on Neutrino Physics for Elementary Particles Physics Course
11/12	Univ. of Rome "Sapienza"	Mechanics (Teaching Assistant)
11/12	Univ. of Rome "Sapienza"	Course: Neutrino Physics for the PhD in Physics(XXVII ciclo)
10/11	Univ. of Rome "Sapienza"	Lecture on Neutrino Physics for Nuclear and SubNuclear Physics II
09/12	Univ. of Rome "Sapienza"	Responsible for the experience "Scintillating crystals light yield vs temperature", High Energy Physics Laboratory course
08/09 09-10 11-12	Univ. of Rome "Sapienza"	Physics for Chemistry and Pharmaceutical Technology (Teaching Assistant)
09/10-10/11	Univ. of Rome "Sapienza"	Tutor of short thesis for Nuclear and SubNuclear Physics III
09/10	Univ. of Rome "Sapienza"	Laboratory of Electromagnetism and Circuit (Teaching Assistant)

04/05 06/07 07/08	Univ. of Rome "Sapienza"	Laboratory of Electromagnetism and Circuit (Teaching Assistant-lezioni di supporto alla didattica)
05/06	Univ. of Rome "Sapienza"	Laboratory of Instruments and Measurement Methods (Teaching Assistant -lezioni di supporto alla didattica), Dip Energetica
05/06	Univ. of Rome "Sapienza"	Computer Science Laboratory for Chemistry and Pharmaceutical Technology (Teaching Assistant-lezioni di supporto alla didattica)
02/03	Univ. of Rome "Sapienza"	Intensive support course for Chemistry and Pharmaceutical Technology (Teaching Assistant)
01/02	Univ. of Rome "Sapienza"	General Physics I for Mathematics (Teaching Assistant-lezioni di supporto alla didattica)
00/01	Univ. of Rome "Roma Tre"	General Physics I (Teaching Assistant)

Part V - Society memberships, Awards and Honors

Years	Title
2009-2010	Member of the Italian Physics Society
2004	Winner of the Grant "Fondazione Angelo Della Riccia" for research in a foreign laboratory (Stanford Linear Accelerator Center)
2000	Winner of the "Enrico Persico" Grant of the "Accademia dei Lincei"
1998	Winner of the "Enrico Persico" Grant of the "Accademia dei Lincei"

Part V-A - Academic Committee membership, Coordination roles

Years	Title
22.02.2017-today	Member of the CAD(Consiglio Area Didattica) committee
2016-2017	Member of Defence Phd Committee in Padova Univ. (XXVIII Ciclo), Rome Sapienza Univ. (XXIX ciclo), Insubria Univ. (XXVIII Ciclo) and "Rappporteur" for the Doctoral School(Particles, Hadrons, Energy, Nuclei, Instrumentation, Imaging, Cosmos et Simulation) Paris 11 Orsay
2016	Member of the committee for the RTD-A Concourse (Dec.Pr. 1748/2016) Padova Physics Dep.
2016-today	Responsible of the Didactics/Research Activity (RADRL) for the Laboratory "Laboratorio di rivelatori criogenici"
20.04.2015 - today	Representative of the Nuclear & Subnuclear Physics curriculum of the "Laura Magistrale LM-17" in the didactic planning committee and member of the committee for student teaching plan approval
2015-today	Contact person for the VQR 2011-2014 and IRIS Database for the Physics Department
10.12.2014-today	President of the SUA-RD 2013 Research Products Committee for the Physics Department
10.12.2014-today	Member of the SUA-RD 2013 Research Resources Committee for the Physics Department

01.12.2014- today	Responsible of the Didactics/Research Activity (RADRL) for the Laboratory MQC / Calder L012-S03
2014	Member of the Committee of the Admission Concourse of the “Tirocinio Formativo Attivo” Classe A038
09.2013-11.2015	Researchers’ Representative in “Giunta di Facoltà SMFN-Sapienza”
04.2013-11.2015	Researchers’ Representative in “Giunta del Dipartimento di Fisica-Sapienza”
2013	President of the committee for the RTD-A Concourse Bando n.19/2013 Sapienza Physics Dep.
2013	Member of the committee for student fellowship, Bando 15931 Gran Sasso Science Institute
2012	Member of the Committee of the Admission Concourse of the “Tirocinio Formativo Attivo” Classe A059
2011-2012	VQR2004-2010: “Sapienza” Contact person for the CUN area 02 and Reviewer
2009-2011	Atheneum Research Products Database Contact person for the CUN area 02
2009-today	Member of a number (approximately 7) of committees of “Assegni di Ricerca”, Univ. of Rome “Sapienza”

Part V-B - Supervisor Activity

Supervisor of 8 MDs theses (now: 4 students are Phd, one is Post-doc, one is employed at Paul Scherrer Institute, one is employed at Nucleico),

6 bachelor theses(dissertazioni),

1 Phd ongoing (student from GSSI, end in fall 2017)

Two Post-docs and one Temporary Researcher (RTD-A) hired on personal fundings.

Part V-B - Research Committee membership, Coordination roles

Years	Title
2017	Computing and networking system administrator for CUPID-0 at Laboratori Nazionali del Gran Sasso
2016	Peer Review Project Referee for the Natural Sciences and Engineering Research Council of Canada
2016	Referee for the VQR 2011-2014
2015-today	Member of REPRISE (Register of Expert Peer Reviewers for Italian Scientific Evaluation)
01.10.2015- today	Technical Coordinator of the CUPID-0 Experiment and PI of the Rome group
2015-today	Referee for Nature Scientific Reports
12.2014-today	Referee of DarkSide 20K experiment for the INFN-CSN2 Astroparticle Physics committee
2014-today	Member of the CUORE-I(nverted)H(ierarchy)E(xplorer) Steering Committee
2012-2014	Chair of the Isotta Measurement Coordination Panel
2011-2015	National PI and Rome Unit PI of LUCIFER R&D
2011-2015	LUCIFER coordinator of data analysis

2010-today	Internal reviewer for CUORE publications
2011-today	Representative of the Sapienza/INFN-Roma group in the CUORE council
05.2012-10.2014	Chair of the CUORE Publication Board
09.2010-05.2012	Member of the CUORE Vetting Board
2009-today	Manager of the CUORE Computing Cluster Center
2013	Supervisor of the simulation of the neutron shields for the TOP-IMPLART project
2010-2011	Supervisor of the analysis of the contaminations and bolometric performances of the first 500 CUORE crystals
2010	Member of the Editorial Board of the proceedings of the Conference “Incontri di Fisica delle Alte Energie”, Italian Physics Society Editor
2009-2010	CUORICINO Data Production Coordinator
2008-today	Referee for Nuclear Instruments and Methods in Physics Research, A
2007-2008	In charge of the data taking quality, integrity and prompt reconstruction.
2007-2008	Coordinator of the CUORE muon identification system
2006-2007	In charge of Monte Carlo simulation of muon and neutron induced background in the CUORE shieldings
2005-2008	Responsible for Data Management of CUORICINO
2005	Babar Internal Reviewer for the analysis “ $B^+ \rightarrow l^+ \nu$ with hadronic tags”
2004	Operation Manager of the BaBar muon and neutral hadrons identification system
2001-2002	In charge of the development of algorithms for the γ/π^0 identification and reconstruction efficiencies in the BaBar calorimeter.

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

Year	Function	Agency/Program	Grant Value (k€)
2016-2017	PI	INFN Rome/CUPID	113
2014	PI	Univ. of Rome “Sapienza”/Grant for Equipments for Interdepartmental Researches: cryogenic setup	100
2014	PI	Univ. of Rome “Sapienza”/Thin film characterisation for light yield optimisation in cryogenic detectors	13
2013	PI	Univ. of Rome “Sapienza”/Intraoperative probe for brain tumour surgery	12
2013	PI	Univ. of Rome “Sapienza”/Assignment of “Assegno di Ricerca” for young coordinators of research projects (Intraoperative probe for brain tumour surgery)	22
2012-2016	PI	MIUR/FIRB 2012: Cryogenic light detector development	244
2012-2015	PI	MIUR/PRIN 2010-11: Low radioactivity detector R&D	142
2012	PI	Univ. of Rome “Sapienza”/Light characterisation of TeO ₂ Cherenkov light	12
2011	PI	Univ. of Rome “Sapienza”/Optical properties study in crystals for the $0\nu\beta\beta$ search	15

2001-2002	BaBar RPC	2nd generation RPCs for the muon and neutral hadrons identification system. I took part in the RCPs production and installation, comprising quality assurance checks able to ensure high standards (mechanical and electrical tests and efficiency measurement).
2001-2002	BaBar Calorimeter	I was part of the Calorimeter Reconstruction Group with the responsibility of the development of algorithms for the γ/π^0 identification and reconstruction efficiencies in the BaBar calorimeter. I elaborated a new matrix method to take into account energy dependences.
1999-2000	KLOE	Master Degree thesis: Regeneration cross section measurement in KLOE for neutral K mesons with $p=110$ MeV/c. The measurement made use of charged K decay exploiting the full capability of the big tracking chamber. It represented one of the first results of the KLOE collaboration and one of the few in the world at such low energy momentum.

Part VII-A - Outreach and technological transfer Activities

Year	Type
2014	Research contract between Sapienza, INFN, IIT, Istituto Europeo di Oncologia and Istituto Neurologico C. Besta for the experimentation of β^- probes for the complete removal of brain tumors.
2013	Patent RM2013A000050 (deposited in 2013) “Sonda di rivelazione di radiazione beta- per l’identificazione intraoperatoria di residui tumorali” -> Extended to PCT N.WOIT000025 (deposited in 2014) including the protection of the methodology.
2.2016	Seminar “Neutrino: L’insostenibile leggerezza dell’essere”. Manifestazione “La fisica incontra la città” Università degli Studi di Roma Tre
10.2013	Article “Assenti giustificati” on the INFN Journal “Asimmetrie” N15/10.13 http://www.asimmetrie.it/images/pdf/asimmetrie-15.pdf
06.03.2012	Seminar “Esplorare il cosmo da sotto la montagna: I Laboratori Nazionali del Gran Sasso”, Manifestazione “I pomeriggi della Scienza, Convitto Nazionale High School
07.04.2011	Lecture on “La fisica in Barca” INFN https://web.infn.it/fisicainbarca2011/
2010-today	Member of the Scientific Committee of “Accastampato”, a journal on physics topics dedicated to high school students.

Part VIII – Summary of Scientific Achievements

The full list of publications can be found at the link [list of publications](#).

Product type	Number	Data Base	Start	End
International	413(362)	ISI(inSpire)	2001	2017
Total impact factor*		~1960		
Total citations		11884(21500)		
Average citation for product		29(59.4)		
Hirsch (H) index		78(79)		
Normalized H index**		~4.9(~4.9)		

* This number is approximated: impact factors are not available for publications in 2014, 2013-impact factors are used in those cases.

**H index divided by the academic seniority =16 (time span from first publication:2001)

2016	3 rd International Meeting for Large Neutrino Infrastructure	<i>Neutrino Mass Measurement (Double Beta) in Europe</i>
2015	25 th International Workshop on Weak Interactions and Neutrinos, Heidelberg,	<i>Search for $0\nu\beta\beta$ decay of ^{130}Te with CUORE-0 and CUORE</i>
2014	4 th Isotope Trace Analysis Workshop, Orsay	<i>Status of the CUORE and CUORE-0 experiments at Gran Sasso</i>
2014	New Frontiers for Majorana fermions form condensed to dark matter, Frascati	<i>The quest for Majorana neutrinos</i>
2014	Rencontres del Moriond Electroweak, La Thuille	<i>Status of the CUORE and CUORE-0 experiments at Gran Sasso</i>
2012	International Symposium on Neutrino Physics and Beyond, Shenzen	<i>Dark Matter searches with the CUORE experiment</i>
2012	Exotic Nuclei and Nuclear/Particle Astrophysics Summer School, Sinaia	<i>The search for Majorana neutrinos with Neutrinoless Double Beta Decays: from Cuoricino to Lucifer experiment</i>
2011	Double Beta Decay and Neutrinos, Osaka	<i>LUCIFER: A Scintillating Bolometer Array for the Search of Double Beta Decay</i>
2010	Flavour Physics and CP Violation, Torino	<i>Neutrinoless Double Beta Decay</i>
2009	Congresso INFN della Sezione di Roma	<i>Rassegna Sperimentale sulla Fisica del Neutrino</i>
2008	Neutrino Oscillation Workshop, Otranto	<i>Neutrinoless Double Beta Decay search with CUORICINO and CUORE experiment</i>
2007	21 st International Workshop on Weak Interactions and Neutrinos, Kolkata	<i>CUORICINO results and CUORE R&D</i>
2006	1 st Boulby Underground Science Workshop, York	<i>CUORICINO results and status of CUORE</i>
2006	2 nd Topical Workshop in Low Radioactivity Technique	<i>Passive shieldings in CUORE</i>
2006	2 nd Symposium on Neutrinos and Dark Matter in Nuclear Physics, Aussois	<i>Cuoricino results and perspectives for Cuore</i>
2006	Universitat de Barcelona	<i>Invited talk: Neutrinoless Double Beta Decay: Present and Future</i>
2005	9 th ICATPP International Conference on Advanced Technology & Particle Physics, Como	<i>Experience with Resistive Plate Chambers at BABAR</i>
2005	COSMO05 IX International Workshop on Particle Physics and the Early Universe, Bonn	<i>CUORICINO results and perspective for CUORE</i>
2005	Univ. of Rome "Sapienza"	<i>Particle Physics Seminar: Doppio Decadimento Beta: risultati da Cuoricino e prospettive per CUORE</i>
2004	RPCs @GIF Final Meeting, CERN	<i>Fluorine studies on Babar RPC</i>
2004	XXIV Physics in Collision, Boston	<i>Poster: "Flavour Changing Neutral Current B decays at BaBar"</i>
2004	VIII International Workshop on Meson Production, Interaction and Decays, Cracov	<i>Radiative B meson decays at BaBar</i>

Claudia Tomei

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Education:

Ph.D. in Physics June 2004 - University of L'Aquila, Italy
Master of Science July 2000 - Faculty of Physics, University of L'Aquila, Italy

Scientific positions covered

1999 - 2000: INFN Fellowship for Master Degree students, LNGS (Gran Sasso National Laboratory), Italy
2000 - 2004: PhD Fellowship LNGS (Gran Sasso National Laboratory), Italy and Max Planck Institute for Nuclear Physics, Heidelberg, Germany
2004: LNGS, Italy, scientific information and outreach (temporary position)
2004 - 2006: LNGS, Italy, researcher (temporary position)
2006 - 2010: INFN, Rome, Italy, researcher (temporary position)
2010 - today: INFN, Rome, Italy, researcher (permanent position)

Summary of the scientific activity

Dr. Tomei started her scientific work at the University of L'Aquila and LNGS for her Master Degree thesis on the ICARUS experiment, a liquid argon TPC for the detection of atmospheric and beam neutrinos. During her PhD, she joined the Heidelberg-Moscow and GENIUS experiment at LNGS and Max Planck Institute for Nuclear Physics, Heidelberg, Germany, for the search of neutrinoless double beta decay with germanium semiconductors.

Following this experience, she became a member of the GERDA experiment at LNGS, for the search of neutrinoless double beta decay with naked germanium semiconductors in liquid argon and, subsequently, of the CUORE experiment at LNGS or the search of neutrinoless double beta decay with Tellurium dioxide cryogenic bolometers.

As researcher at INFN, Rome from 2006, Dr. Tomei worked in the frame of the following experiments:

- CUORE: PI of the INFN Rome group since 2017, experimental test of cryogenic bolometers at LNGS, CUORE prototype (CUORE-0) operation, software development and data analysis, CUORE software development, member of the CUORE Physics Board from 2013 to 2016, mentoring of students and postdocs;
- LUCIFER/CUPID (search of neutrinoless double beta decay with scintillating cryogenic bolometers at LNGS): experimental test of cryogenic bolometers at LNGS, software development and data analysis;
- CALDER (Cryogenic wide-area Light Detectors with Excellent Resolution): light calibration and simulations;
- SABRE (Sodium Iodide with Active Background Rejection, for the search of Dark Matter at LNGS): PI of the INFN Rome group, Montecarlo simulations, mentoring of students and postdocs.

Dr. Tomei is author of more than 90 scientific papers including articles published in scientific journals or at international conferences reports, internal publications and interventions at international conferences and workshops.

2004	XVI Incontro di Fisica della Alte Energie, Torino	<i>Radiative and Leptonic Rare B-decays</i>
2003	Società Italiana di Fisica, Congresso Nazionale 2003, Parma	<i>Misura del Branching Ratio Inclusivo $b \rightarrow s\gamma$</i>
2003	Univ. of Rome "Sapienza"	<i>Particle Physics Seminar: Decadimenti radiativi ed elettrodeboli con transizione $b \rightarrow s(d)$ in BaBar</i>
2000	LNF Spring School in Nuclear Subnuclear and Astroparticle Physics, Frascati	<i>$KL \rightarrow KS$ regeneration in the KLOE detector</i>

Part XII- Participation in high quality organisations/laboratories, research institutes
Years **Institution**

2.2005-	Gran Sasso National Laboratories
2012-2014	Four short-periods for research activity at the Cryogenic Laboratory of the Centre de Sciences Nucléaires et de Sciences de la Matière - ORSAY
04.2001-04.2008	Stanford Linear Accelerator Center
09.1999-07.2000	Frascati National Laboratories

I was involved in a test beam at CERN in 2010.

I was involved in a test on the mechanical structure of CUORE at Laboratori ENEA-Casaccia in 2005.

Roma, li 28.12.2015

Firma