

# Curriculum Vitae of Vincenzo Guidi

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## Personal information

Vincenzo Guidi  
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## Education and academic career

- Bachelor in Physics "Laurea quadriennale a ciclo unico" (110/110 cum laude) at University of Ferrara achieved on July 12<sup>th</sup>, 1990
- Fellow at at Budker Institute for Nuclear Physics (Russia) in 1991
- Award for scientific merit given by the Italian Physics Society in 1992
- PhD in Physics, University of Ferrara achieved on October 17<sup>th</sup>, 1994
- Researcher in General Physics (B01A) at University of Ferrara from 1994 to 2006
- Associate Professor of Experimental Physics (FIS/01) at University of Ferrara from 2006 to 2011
- Full Professor of Experimental Physics (FIS/01) at University of Ferrara since 2011

## Institutional responsibilities

- Head of the Sensors and Semiconductors lab at Ferrara University (coordinating 25 people)
- Director of the Doctoral School in Physics at Ferrara University (43 people in the doctoral council)
- Member of the GEV panel in Physics for evaluating research products by ANVUR
- Former delegate of the Rector ("*Prorettore*") of Ferrara University for "Sustainability Policies" of the University of Ferrara in 2014 and 2015. During this term, photovoltaic plants of 1.2 MW power were built, leading to 57% of the total consumption owing to renewable sources for Ferrara University.
- Former member of the Academic Senate of Ferrara University (2 years)
- Former member of the Administration Council of Ferrara University (2 years)
- Former member of the Research Council of Ferrara University (8 years)
- Former coordinator of the CSN V of INFN (6 years) and observer for such committee in the CSN III (3 years)
- Local and national coordinator of projects of MIUR, coordinator of several European and regional projects.
- National coordinator of projects of by the CSN V (COHERENT in 2010-12, ICE-RAD in 2013-14, CHANEL in 2015-16), local coordinator of the CSN I (UA9 experiment since 2011).
- National coordinator of a six-year long special project of INFN for New Technologies for Accelerators (NTA-HCCC in 2004-10).

## Scientific activity

- The scientific activity of Vincenzo Guidi (VG) has consisted of two fields of interest: Semiconductor Physics and Accelerator Physics, with special attention to the applications of the former to the latter. Most of the activity has been largely based on experiments financed by the CSN V or by special project NTA.
- VG initially studied photoemission from GaAs as a non conventional electron source. It was demonstrated that a GaAs photocathode is a sub-thermal source of electrons and that the resulting emitted beam, after acceleration in a proper optics, can attain a special condition with a plasma parameter greater than one, i.e., with liquid-like behaviour in beam dynamics. GaAs was also identified to be suitable as a photo-emitter for a spin-polarized high-density electron source in a RF gun.
- From 2000 onward, VG undertook research activity with major Russian Institutions about manipulation of relativistic particle beams (1-1000 GeV) for reflection, extraction, collimation, focusing,

undulation, and others via coherent interactions in crystals. Owing to the crystal designed and fabricated at INFN Ferrara, it proved possible to achieve crystal-assisted proton extraction out from a proton synchrotron at extraordinarily high efficiency (larger than 85% to be compared to a few-percent figures of previous experiments). By re-visitation and adaptation of micro-fabrication techniques of high-quality silicon crystals, it was discovered the effect of volume reflection, a new coherent effect of a particle in a crystal. Such an effect highlighted single-pass deflection efficiency larger than 97% for 400 GeV protons in a silicon crystal. These results enabled the proposition of an experiment for collimation in the SPS of CERN (by the UA9 collaboration), which recently culminated in the successful collimation of 6.5 TeV proton beam in the LHC. Crystal-assisted techniques are nowadays regarded as powerful tools for accelerator physics.

The hard and intense radiation generated by electrons as a result of coherent interaction with atoms of a bent crystal was recently demonstrated to be an innovative method for production of gamma rays with superior characteristics than it would be achieved by synchrotron radiation as generated by the same incoming beam (ICE-RAD, CHANEL experiments).

Currently, SSL is supplier of crystals to study coherent interactions to major laboratories worldwide, such as CERN, SLAC, IHEP and MAMI.

- Owing to the experience gained on semiconductors, VG co-founded the Sensors and Semiconductors Lab (SSL) at Ferrara University with the aim to support INFN experiments and to seek for potential applications of the semiconductors that could be spinned-off to industries or capital venturers. This activity was particularly fruitful initially in the field of chemical sensing based on semiconductors and more recently on concentrated photovoltaics. Very recently a plant for the production of photovoltaics modules equipped with an innovative tracker and concentration geometry, borrowed by Cassgrain telescopes, was constructed in Crevalcore (Bologna) thanks to the investment of 4 million euro private capitals. Other two startups were recently founded as a result of research activities by the SSL.
- There are currently four main activities being pursued at SSL, of which VG is the coordinator, namely concentrated photovoltaics, gas sensing via chemo-resistive materials, silicon micro-fabrication for investigation of coherent effect in crystals and hard x-ray optics through curved crystals. At SSL, counting 25 people, basic investigations on semiconductors are harmonized with a traditional inclination toward applied research.
- During his career, VG has performed more than 25 invited talks, organized five international conferences and a national meeting, was editor and guest editor of peer-reviewed international scientific journals.
- VG published more than 250 papers and more than 230 contributions to conference or workshop proceedings, was organizer of international conferences and editor of the proceedings, was author of chapters in books, resulting in a Hirsh factor of 46 (scholar.google.com).

## **Bibliometric parameters**

Ferrara, April 24<sup>th</sup>, 2017

## Curriculum Vitæ of Gianluca Cavoto

- Name: Cavoto
- First Name: Gianluca

*last update Oct 2016*

## Education

- January 16<sup>th</sup>, 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.
- 29<sup>th</sup> 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.

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## 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 **CRYSEAM** - *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.

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### 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  $\alpha$  and  $\gamma$  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 [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 **D<sup>0</sup>-mixing analyses** ([sp28]), in particular **main author** of time-dependent Dalitz analysis of  $D^0 \rightarrow K\pi\pi^0$  for the extraction of D<sup>0</sup>-mixing parameter ([sp49,sp25]), invited to present this result [s11,s12,s14,s15].
- 2005-2007 **main author** of D<sup>0</sup> 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  $\beta$  and  $\gamma$  in Charm B decays* [o7].
- since Mar 05 **convenor** of CKM 2005 in San Diego (USA) *Measurements of  $\beta$  and  $\gamma$  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  $\gamma$  of CKM matrix** in  $B^- \rightarrow D^{(*)0}K^-$  with a Dalitz analysis [sp41, sp15] , invited talk at ICHEP06 on  $\gamma$  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  $\alpha$  and  $\gamma$  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  $\alpha$  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  $\alpha$  [sp29, o9].
- 1997- 1998 *BaBar Physics Workshop* , study of sensitivity to twobody charmless B decays [bk1].

## Teaching and tutoring Experience

- 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).
- 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 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 temporary **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 2016-10-26

806 papers found, 795 of them citeable (published or arXiv)

#### Resoconto delle citazioni

	Citeable papers	Published only
<b>Total number of papers analyzed:</b>	<a href="#">795</a>	<a href="#">527</a>
<b>Numero totale di citazioni:</b>	40,318	32,780
<b>Numero medio di citazioni per articolo:</b>	50.7	62.2
<b>Suddivisione degli articoli in base alle citazioni:</b>		
Renowned papers (500+)	<a href="#">9</a>	<a href="#">6</a>
Famous papers (250-499)	<a href="#">14</a>	<a href="#">11</a>
Very well-known papers (100-249)	<a href="#">70</a>	<a href="#">66</a>
Well-known papers (50-99)	<a href="#">117</a>	<a href="#">105</a>
Known papers (10-49)	<a href="#">395</a>	<a href="#">271</a>
Less known papers (1-9)	<a href="#">171</a>	<a href="#">63</a>
Unknown papers (0)	<a href="#">19</a>	<a href="#">5</a>
$h_{\text{HEP}}$ index [?]	98	93

**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.*

- [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]].
- [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

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- [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).
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- [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).
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### Talks to conferences and workshops.

- [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  $M \lesssim 10$  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* ;
- [c16] May 2007, FPCP 07 Bled (Slovenia), invited talk on *Charm Dalitz analyzes* ;

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- [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  $B \rightarrow \rho\pi$  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  $\gamma$  and  $V_{ub}$*  ;
  - [c9] Aug 2004, 32<sup>nd</sup> International Conference on High Energy Physics, ICHEP04, Beijing (China), invited talk *Measurement of  $\gamma$  and  $\sin 2\beta + \gamma$  in BaBar* ;
  - [c8] Apr 2004, XVI Incontro Fisica della Alte Energie, Parma (Italy), invited talk *Measurements of  $\sin 2\alpha$  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  $B^0 \rightarrow \pi^+\pi^-$ ,  $K^+\pi^-$ ,  $K^+K^-$  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  $B^0$  decays*.

### Seminars.

- [s27] May 2016. Univ. Napoli - *Detecting Dark Matter with CNT*
- [s26] Feb 2016. Scuola Normale Superiore Pisa - *New Ideas for detecting Dark Matter*

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- [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  $\mu$  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* ;

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**Conference proceedings.**

- [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.
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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

## Curruculum vitae della Dott.ssa Stefania Vecchi.

Studi e attività lavorativa:

- 1991: Laurea in Fisica (vecchio ordinamento) presso l'Università di Bologna con voto 110/110 e lode;
- 1992: diploma della Scuola di Perfezionamento in Fisica dell'Università di Bologna;
- 1992-1993: borsa di studio INFN per neolaureati della durata di 2 anni;
- 1994-1997: contratto a tempo determinato dell'INFN (art.36) presso la sezione di Bologna della durata di 30 mesi;
- 1999-oggi: ricercatrice INFN a tempo indeterminato INFN presso le sezioni di Bologna (1999-2009) e Ferrara (dal 2009 ad oggi).

Attività scientifica, di ricerca e di terza missione:

- 1991-2005: Esperimento OBELIX presso il CERN:
  - contribuito alle diverse attività dell'esperimento quali la presa dati, la manutenzione e l'ottimizzazione del calorimetro elettromagnetico dell'esperimento;
  - studio approfondito dei dati dell'esperimento e analisi di fisica nell'ambito della spettroscopia mesonica a bassa energia (ricerca di stati esotici, studio dei meccanismi di produzione e delle regole di selezione).
- 1993-1995: contribuito allo sviluppo di un rivelatore per neutroni veloci operante presso i Laboratori INFN del Gran Sasso.
- 1995-1996: partecipazione all'esperimento HeraB presso il DESY;
- 2000-oggi: pieno coinvolgimento nell'esperimento LHCb presso il CERN:
  - contribuito alla costruzione delle camere a fili per la rivelazione dei muoni;
  - studio delle prestazioni del rivelatore di muoni dell'esperimento con i raggi cosmici e i primi dati di collisione acquisiti;
  - allineamento spaziale del rivelatore di muoni dell'esperimento con le tracce di raggi cosmici e i primi dati di collisione acquisiti;
  - studi di fattibilità di alcune misure di violazione di CP;
  - studio degli algoritmi di identificazione del flavour iniziale dei mesoni B neutri (*"Flavour tagging"*) su dati simulati e acquisiti dall'esperimento (ottimizzazione delle efficienze e sviluppo di nuovi algoritmi);
  - autrice di diverse analisi dei dati dell'esperimento.
  - 2015: referente locale per l'organizzazione delle attività svolte a Ferrara in occasione della *notte europea dei ricercatori*;
  - 2012-2017: collaboratrice alla realizzazione delle *"International Master Classes in fisica delle particelle"* per gli studenti delle scuole superiori di Ferrara e di altre province.

Responsabilità e incarichi:

- 2010-2013: responsabile del gruppo LHCb a Ferrara;
- 2010-oggi: responsabile dell'allineamento spaziale del rivelatore di muoni dell'esperimento

LHCb;

- 2012-2013: responsabile del gruppo di lavoro sul “*Flavour Tagging*” dell’esperimento LHCb;
- 2015-2016: responsabile dello Speakers’ Bureau dell’esperimento LHCb;
- 2012-oggi: referente per il Dipartimento di Fisica e Scienze della Terra dell’Università di Ferrara e la sezione INFN dell’organizzazione dei seminari di Fisica;
- 2013-2014: componente della commissione di esame per l’assegnazione degli assegni di ricerca della sezione INFN di Ferrara;
- 2011-oggi: componente del collegio dei docenti del dottorato in Fisica dell’Università di Ferrara;
- 2013-oggi: rappresentante dei ricercatori INFN per la sezione di Ferrara.
- 2012: componente del comitato organizzatore locale di IFAE2012 (Ferrara, Italia);
- 2014: convener della sessione “Frontiera dell’intensità” della conferenza IFAE2014 (LNGS, Italia);
- 2017: convener della sessione “Heavy Flavour” della conferenza LHCP 2017 (Shanghai, Cina).

Pubblicazioni e partecipazione a conferenze:

- autrice in collaborazione di circa 500 pubblicazioni su riviste internazionali;
- relatrice a diversi workshop e conferenze nazionali ed internazionali, tra le quali le più importanti sono: BEAUTY2011, ICHEP2012, CKM2016.

Ferrara, 19 Aprile 2017

Il Dichiarante  
