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Personal information

Surname(s) / First name(s) **Tarantino Cecilia**

Academic career

November 2014 – present **Associate Professor in Theoretical Physics**
Roma Tre University, Rome

January 2007 – October 2014 University Researcher in Theoretical Physics
Roma Tre University, Rome

November 2005 – December 2006 Post-doc grant, for research activity in Theoretical Physics
Technische Universitaet Muenchen, Munich

Education and pre-doctoral positions

February 2006 Ph. D. in Theoretical Physics
Roma Tre University, Rome
Advisor: prof. Vittorio Lubicz

2002 INFN pre-doctoral fellow
Roma Tre University, Rome

April 2002 Laurea degree in Theoretical Physics (Summa cum Laude)
Roma Tre University, Rome
Advisor: prof. Vittorio Lubicz

Awards

2006 Sergio Fubini 2006 prize, for three Ph. D. theses in Theoretical Physics
National Institute of Nuclear Physics (INFN) Theory Group

2005 Young Women in Physics 2005 prize, for young female researchers in Physics
Physics Department, Roma Tre University

2005 Best Ph. D. Seminar 2005 prize
Physics, Astronomy and Material Science Departments of the three Universities of Rome

2002 Antonio Stanghellini 2002 fellow for graduated students in Physics
Italian Physics Society (SIF)

2002 Galluzzi 2002 prize for Physics, for a graduated student in Physics
Roma Tre University

Research activity

Research interests **Flavor Physics, Lattice QCD**

Synthetic description of the field

The study of the flavor sector of the Standard Model (SM) deals with fundamental questions which are still open in particle physics. Within the SM there is no explanation for the great hierarchy among different fermion masses, nor for the presence of three families, nor for the structures of the mixing matrices, which are very different between the quark sector (Cabibbo-Kobayashi-Maskawa matrix) and the lepton sector (Pontecorvo-Maki-Nakagawa-Sakata matrix). Moreover, the mixing among different flavors of quarks represents the only source of CP-violation in the Standard Model, an effect which has been proven to be too small, however, to explain the observed dominance of matter over anti-matter in the Universe. This observation provides therefore a strong hint for the existence of new sources of CP-violation beyond the SM. Research activities in Flavor Physics aims at clarifying these open questions by testing the SM itself with increasing accuracy and by searching New Physics (NP) effects through indirect searches, i.e. by looking at processes that are sensitive to virtual (loop) contributions of NP particles. In the last years a new era of exploration has started with the coming into operation of the Large Hadron Collider (LHC) at CERN. From the theory side, it will be crucial to keep pace with the experimental accuracy, with Lattice QCD simulations playing a fundamental role in the determination of the non-perturbative hadronic parameters, which often enclose the main source of theoretical uncertainty.

Citations

My (about 50) published papers count about 4300 citations on the inSPIRE.net database.
They include 3 famous (more than 250 citations) papers, 13 very well known (100-250 citations) papers and 14 well known (50-99 citations) papers.

International scientific collaborations

UTfit collaboration, composed of Theorists and Experimentalists from various European nations, working at the determination of the parameters of the Cabibbo-Kobayashi-Maskawa matrix

European Twisted Mass collaboration (ETMC), composed of Lattice QCD experts from various European nations, working at the computation of quantities of interest for High Energy Physics

Research programs

2010-2012 Participant in the **Prin 2008** research program on “Predictions and theoretical proposals for present and future experiments in particle physics”

2013-2016 Participant in the **Prin 2012** research program on “Symmetries, masses and mysteries: electroweak symmetry breaking, flavor mixing and CP-violation, dark matter in the LHC era”

2017-2020 Participant in the **Prin 2015** research program on “Search for the Fundamental Laws and Constituents”

Invited talks at conferences and workshops

May 2014 Planck 2014, 17th International Conference From the Planck Scale to the Electroweak Scale, Paris
plenary review talk

September 2013 SIF 2013, XCIX Congresso Nazionale della Società Italiana di Fisica, Trieste

September 2013 WIN 2013, The XXIV Workshop on weak interactions and neutrinos, Natal (Brazil)
theory summary talk

July 2012 ICHEP’12, XXXVI International Conference on High Energy Physics, Melbourne (Australia)
plenary review talk

June 2012 Lattice 2012 The XXX International Symposium on Lattice Field Theory, Cairns (Australia)
plenary review talk

June 2012 International Collaboration Meeting “Super B IV”, Isola d’Elba

May 2012 The V International Workshop on Charm Physics, Honolulu (Hawaii)

September 2011 The XV Workshop on Statistical Mechanics and nonperturbative Field Theory, Bari

April 2011 Incontri sulla Fisica delle Alte Energie, IFAE 2011, Perugia

October 2010 International Conference “Heavy Quarks and Leptons 2010”, Frascati National Laboratories (LNF)

October 2009 V_{xb} Workshop, SLAC (USA)

April 2009 Ringberg Workshop on New Physics, Flavors and Jets, Ringberg Castle, Rottach-Egern

January 2008 V Workshop Italiano sulla Fisica p-p ad LHC, Perugia

May 2007 International Conference “Kaon’07”, Frascati National Laboratories (LNF)

April 2007	Incontri sulla Fisica delle Alte Energie, XVIII-IFAE, Napoli
December 2006	CKM 2006: Workshop on the Unitarity Triangle, Nagoya (Japan)
November 2006	International Workshop “Super B IV”, Villa Mondragone, Monte Porzio Catone
October 2006	International Conference “Heavy Quarks and Leptons 2006”, Munich
May 2006	Flavor in the LHC Era-3^{rd} Workshop on the Interplay of Flavor and Collider Physics, CERN Geneva
June 2005	Beauty 2005: 10^{th} International Conference on B-Physics at Hadron Machines, Assisi
April 2005	Workshop on Effective Field Theory, QCD and Heavy Hadrons, Seattle (USA)
March 2005	CKM 2005: Workshop on the Unitarity Triangle, San Diego (USA)
April 2004	Incontri sulla Fisica delle Alte Energie, XVI-IFAE, Torino
July 2003	International Europhysics Conference on High Energy Physics, EPS HEP 2003, Aachen
April 2002	Incontri sulla Fisica delle Alte Energie, XIV-IFAE, Parma

Organization of scientific conferences, workshops and schools

September 2014	International Advisory Committee of the Doctoral School on Lattice Gauge Theories, Parma
June 2014	International Advisory Committee of the XXXII International Symposium on Lattice Field Theory, New York (USA)
April 2014	Convener of “Incontri di Fisica delle Alte Energie”, Gran Sasso National Laboratories
September 2013	Convener of the XXIV Workshop on weak interactions and neutrinos, Natal (Brazil)
July 2013	International Advisory Committee of the XXXI International Symposium on Lattice Field Theory, Mainz
July 2011	Convener of the International Europhysics Conference on High Energy Physics, Grenoble
June 2010	Local Organizing Committee of the XXVIII International Symposium on Lattice Field Theory, Cagliari
February 2010	Local Organizing Committee of the Galileo Galilei Institute (GGI) Workshop on “Indirect Searches for New Physics at the time of LHC”, Firenze
December 2009	Convener of the X SuperB Physics Workshop, Frascati National Laboratories (LNF)
April 2009	Convener of the VIII SuperB Physics Workshop, Warwick
September 2008	Convener of the V International Workshop on the CKM Unitarity Triangle, Roma

Teaching

Lectures of Physics of Fundamental Interactions (master, 8 CFU), Roma Tre University
AY 2018/2019, AY 2017/2018, 2016/2017, 2015/2016, 2013/2014, 2012/2013, 2011/2012

Exercises of Quantum Mechanics (bachelor, 3 CFU), Roma Tre University
AY 2018/2019, AY 2017/2018, 2016/2017, 2015/2016, 2013/2014, 2012/2013, 2011/2012, 2009/2010, 2008/2009, 2007/2008, 2004/2005, 2003/2004

Lectures of Quantum Mechanics (TFA and PAS for High School teachers), Roma Tre University
AY 2013/2014, 2012/2013

Lectures of Quantum Field Theory (master, 6 CFU), Roma Tre University
AY 2009/2010, 2007/2008

Exercises of Theoretical Physics (in English), Tecnische Universitaet Muenchen, Munich
AY 2006/2007, 2005/2006

Exercises of Statistical Mechanics (in English), Tecnische Universitaet Muenchen, Munich
AY 2005/2006

Lectures on Flavor Physics (ICTP Summer School on Particle Physics), Trieste, June 2011

Supervision of theses

AY 2017/2018	Simone Romiti (master student in Physics, Roma Tre University)
	Title of the thesis: *Optimization techniques in the lattice calculation of the hadronic contribution to the muon anomaly*
AY 2016/2017	Fabio Grimaldi (diploma student in Physics, Roma Tre University)
	Title of the thesis: *Study of the WKB method and application to the alpha decay*
AY 2015/2016	Alessio Mattia Leonardi (diploma student in Physics, Roma Tre University)
	Title of the thesis: *Perturbation theory at high orders in quantum mechanics and its numerical applications*
AY 2013/2014	Matteo Stasi (diploma student in Physics, Roma Tre University)
	Title of the thesis: *WKB method for the semiclassical approximation and application to the tunnel diod*
AY 2013/2014	Daniele Carlotti (diploma student in Physics, Roma Tre University)
	Title of the thesis: *Isotropic harmonic oscillator in three dimensions*
AY 2012/2013	Elena La Preziosa (master student in Mathematics, Roma Tre University)
	Title of the thesis: *Variational method applied to hydrogen ion molecule*
AY 2011/2012	Paolo Lami (master student in Physics, Roma Tre University)
	Title of the thesis: *Determination of quark masses and decay constants from Nf=2+1+1 Lattice QCD*
AY 2010/2011	Elisa Giunta (student in Mathematics, Roma Tre University)
	Title of the thesis: *WKB method: application to the double well potential*

Activities of public dissemination of science

2011, 2012, 2014, 2016, 2017	Introductory lecture on Quantum Mechanics
	Masterclass in Particle Physics, INFN (Roma Tre Section) and Roma Tre University
2014	Presentation of the Department research activities based on numerical simulations
	Open Day, Mathematics and Physics Department, Roma Tre University

Referee activities

2015 – present	Member of REPRISE (Register of Expert Peer Reviewers for Italian Scientific Evaluation)
2006 – present	Referee for journals:
	JHEP, European Physical Journal C, Nuclear Physics B, Physical Review D, Physical Review Letters, Physics Letters B
2013	Referee of the Ph. D. theses
	Title: Meson-antimeson oscillations in the SM and beyond from unquenched TM-Lattice QCD
	Student: Nuria Carrasco Vela (Valencia University)
	Title: Decays of the B-mesons to the first-orbitally excited D** mesons
	Student: Mariam Atoui (Particle Physics Laboratory, Clermont-Ferrand)
2008 – present	Referee of several diploma and master theses

University/Department/INFN activities

June 2016 – present	**Member of the Roma Tre Evaluation Nucleus** (Evaluation of the University Quality in Teaching and Research)
November 2015 – present	**Member of the University Scientific Committee for the VQR** (Evaluation of Research Quality)
2013 – present	**National Coordinator of the INFN research line on Lattice QCD named LQCD123**
2016	Member of the Committee for the entrance examination to the Physics Ph.D.
2014	**Coordinator of PAS038** (course for the qualification of High School Physics teachers)
2015 – 2018	Member of the Physics Didactic Committee
2013 – present	Member of the Physics Doctoral School Committee
2013	Member of the Joint (professors-students) Committee of the Mathematics and Physics Department
2013 – 2014	Member of the INFN (Roma Tre Section) Committee for postdoc fellowships in Theoretical Physics

Publications

V. Lubicz *et al.* [ETM Collaboration],
Tensor form factor of $D \to \pi(K)\ell\nu$ and $D \to \pi(K)\ell\ell$ decays with $N_f = 2+1+1$ twisted-mass fermions
Phys. Rev. D **98** (2018) no.1, 014516, [arXiv:1803.04807 [hep-lat]].

D. Giusti *et al.* ,
First lattice calculation of the QED corrections to leptonic decay rates
Phys. Rev. Lett. **120** (2018) no.7, 072001, [arXiv:1711.06537 [hep-lat]].

V. Lubicz *et al.* [ETM Collaboration],
Scalar and vector form factors of $D \to \pi(K)\ell\nu$ decays with $N_f = 2+1+1$ twisted fermions
Phys. Rev. D **96** (2017) no.5, 054514, [arXiv:1706.03017 [hep-lat]].

D. Giusti, V. Lubicz, C. Tarantino, G. Martinelli, S. Sanfilippo, S. Simula and N. Tantalo
Leading isospin-breaking corrections to pion, kaon and charmed-meson masses with Twisted-Mass fermions
Phys. Rev. D **95** (2017) no.11, 114504, [arXiv:1704.06561 [hep-lat]].

A. Bussone *et al.* [ETM Collaboration]
Mass of the b quark and B -meson decay constants from N_f=2+1+1 twisted-mass lattice QCD
Phys. Rev. D **93** (2016) no.11, 114505, [arXiv:1603.04306 [hep-lat]].

N. Carrasco, P. Lami, V. Lubicz, L. Riggio, S. Simula and C. Tarantino [European Twisted Mass Collaboration]
$K \to \pi$ semileptonic form factors with $N_f = 2+1+1$ twisted mass fermions
Phys. Rev. D **93** (2016) no.11, 114512, [arXiv:1602.04113 [hep-lat]].

N. Carrasco *et al.* [European Twisted Mass Collaboration]
ΔS=2 and ΔC=2 bag parameters in the standard model and beyond from N_f=2+1+1 twisted-mass lattice QCD
Phys. Rev. D **92** (2015) 3, 034516, [arXiv:1505.06639 [hep-lat]].

N. Carrasco *et al.*
QED Corrections to Hadronic Processes in Lattice QCD
Phys. Rev. D **91** (2015) 7, 074506, [arXiv:1502.00257 [hep-lat]].

N. Carrasco *et al.* [European Twisted Mass Collaboration]
Leptonic decay constants f_K, f_D, and f_{D_s} with $N_f = 2+1+1$ twisted-mass lattice QCD
Phys. Rev. D **91** (2015) 5, 054507, [arXiv:1411.7908 [hep-lat]].

N. Carrasco *et al.* [European Twisted Mass Collaboration]
D-Dbar Mixing in the Standard Model and Beyond from Nf=2 Twisted Mass QCD
Phys. Rev. D **90** (2014) 1, 014502, [arXiv:1403.7302 [hep-lat]].

N. Carrasco *et al.* [European Twisted Mass Collaboration]
Up, down, strange and charm quark masses with Nf = 2+1+1 tmLattice QCD
Nucl. Phys. B **887** (2014) 19 [arXiv:1403.4504 [hep-lat]].

A. J. Bevan *et al.* [UTfit Collaboration]
The UTfit collaboration average of D meson mixing data: Winter 2014
JHEP **1403** (2014) 123, [arXiv:1402.1664 [hep-ph]].

N. Carrasco *et al.* [European Twisted Mass Collaboration]
B-physics from $N_f = 2$ tmQCD: the Standard Model and beyond
JHEP **1403** (2014) 016, [arXiv:1308.1851 [hep-lat]].

V. Bertone *et al.* [European Twisted Mass Collaboration]
Kaon Mixing Beyond the SM from $N_f = 2$ tmQCD and model independent constraints from the UTA
JHEP **1303** (2013) 089, [arXiv:1207.1287 [hep-lat]].

A. J. Bevan *et al.* [UTfit Collaboration]
The UTfit Collaboration Average of D meson mixing data: Spring 2012
JHEP **1210** (2012) 068, [arXiv:1206.6245 [hep-ph]].

D. Becirevic *et al.*
D-meson decay constants and a check of factorization in non-leptonic B-decays
JHEP **1202** (2012) 042, [arXiv:1201.4039 [hep-lat]].

G. M. de Divitiis *et al.*
Isospin breaking effects due to the up-down mass difference in Lattice QCD
JHEP **1204** (2012) 124, [arXiv:1110.6294 [hep-lat]].

P. Dimopoulos *et al.* [European Twisted Mass Collaboration]
Lattice QCD determination of m_b, f_B and f_{Bs} with twisted mass Wilson fermions
JHEP **1201** (2012) 046, [arXiv:1107.1441 [hep-lat]].

B. Blossier *et al.* [European Twisted Mass Collaboration]
Average up/down, strange and charm quark masses with $N_f = 2$ twisted mass lattice QCD
Phys. Rev. D **82** (2010) 114513, [arXiv:1010.3659 [hep-lat]].

B. Blossier *et al.* [European Twisted Mass Collaboration]
A proposal for B-physics on current lattices
JHEP **1004** (2010) 049, [arXiv:0909.3187 [hep-lat]].

M. Bona *et al.* [UTfit Collaboration]
An Improved Standard Model Prediction of $BR(B \to \tau\nu)$ and Its Implications for New Physics
Phys. Lett. B **687** (2010) 61, [arXiv:0908.3470 [hep-ph]].

M. Blanke, A. J. Buras, B. Duling, S. Recksiegel and C. Tarantino
FCNC Processes in the Littlest Higgs Model with T-Parity: a 2009 Look
Acta Phys. Polon. B **41** (2010) 657, [arXiv:0906.5454 [hep-ph]].

V. Lubicz, F. Mescia, S. Simula and C. Tarantino [European Twisted Mass Collaboration]
$K \to \pi$ Semileptonic Form Factors from Two-Flavor Lattice QCD
Phys. Rev. D **80**, 111502(R) (2009), [arXiv:0906.4728 [hep-lat]].

B. Blossier *et al.* [European Twisted Mass Collaboration]
Pseudoscalar decay constants of kaon and D-mesons from $N_f = 2$ twisted mass Lattice QCD
JHEP **0907** (2009) 043, [arXiv:0904.0954 [hep-lat]].

M. Blanke, A. J. Buras, S. Recksiegel and C. Tarantino
The Littlest Higgs Model with T-Parity Facing CP-Violation in $B_s - \bar{B}_s$ Mixing
arXiv:0805.4393 [hep-ph].

G. Buchalla *et al.*
B, D and K decays
Eur. Phys. J. C **57** (2008) 309 [arXiv:0801.1833 [hep-ph]].

M. Raidal *et al.*
Flavor physics of leptons and dipole moments
Eur. Phys. J. C **57** (2008) 13 [arXiv:0801.1826 [hep-ph]].

B. Blossier *et al.* [European Twisted Mass Collaboration]
Light quark masses and pseudoscalar decay constants from $N_f = 2$ Lattice QCD with twisted mass fermions
JHEP **0804** (2008) 020, [arXiv:0709.4574 [hep-lat]].

M. Blanke, A. J. Buras, S. Recksiegel, C. Tarantino and S. Uhlig
Correlations between epsilon'/epsilon and Rare K Decays in the Littlest Higgs Model with T-Parity
JHEP **0706** (2007) 082, [arXiv:0704.3329 [hep-ph]].

M. Blanke, A. J. Buras, S. Recksiegel, C. Tarantino and S. Uhlig
Littlest Higgs model with T-parity confronting the new data on D0 anti-D0 mixing
Phys. Lett. B **657** (2007) 81, [arXiv:hep-ph/0703254].

M. Blanke, A. J. Buras, B. Duling, A. Poschenrieder and C. Tarantino
Charged lepton flavor violation and (g-2)(mu) in the littlest Higgs model with T-parity: A clear distinction from supersymmetry
JHEP **0705** (2007) 013, [arXiv:hep-ph/0702136].

M. Blanke, A. J. Buras, A. Poschenrieder, S. Recksiegel, C. Tarantino, S. Uhlig and A. Weiler
Rare and CP-violating K and B decays in the littlest Higgs model with T-parity
JHEP **0701** (2007) 066, [arXiv:hep-ph/0610298].

M. Blanke, A. J. Buras, A. Poschenrieder, S. Recksiegel, C. Tarantino, S. Uhlig and A. Weiler
Another look at the flavor structure of the littlest Higgs model with T-parity
Phys. Lett. B **646** (2007) 253, [arXiv:hep-ph/0609284].

D. Becirevic, P. Boucaud, V. Lubicz, G. Martinelli, F. Mescia, S. Simula and C. Tarantino
Exploring twisted mass lattice QCD with the clover term
Phys. Rev. D **74** (2006) 034501, [arXiv:hep-lat/0605006].

M. Blanke, A. J. Buras, D. Guadagnoli and C. Tarantino
Minimal flavor violation waiting for precise measurements of ΔM_s, $|V_{ub}|$, γ and $B^0_{s,d} \to \mu^+\mu^-$
JHEP **0610** (2006) 003, [arXiv:hep-ph/0604057].

D. Becirevic, B. Blossier, Ph. Boucaud, V. Gimenez, V. Lubicz, F. Mescia, S. Simula and C. Tarantino
Non-perturbatively renormalised light quark masses from a lattice simulation with $N_f = 2$
Nucl. Phys. B **734** (2006) 138, [arXiv:hep-lat/0510014].

D. Becirevic, G. Isidori, V. Lubicz, G. Martinelli, F. Mescia, S. Simula and C. Tarantino
The $K \to \pi$ vector form-factor at zero momentum transfer on the lattice
Nucl. Phys. B **705** (2005) 339, [arXiv:hep-lat/0403217].

M. Ciuchini, E. Franco, V. Lubicz, F. Mescia and C. Tarantino
Lifetime differences and CP violation parameters of neutral B-mesons at the next-to-leading order in QCD

JHEP **0308** (2003) 031, [arXiv:hep-ph/0308029].

D. Becirevic, V. Lubicz, F. Mescia and C. Tarantino [SPQcdR Collaboration]
Coupling of the light vector meson to the vector and to the tensor current
JHEP **0305** (2003) 007, [arXiv:hep-lat/0301020].

D. Becirevic, V. Lubicz and C. Tarantino [SPQcdR Collaboration]
Continuum determination of light quark masses from quenched lattice QCD
Phys. Lett. B **558** (2003) 69, [arXiv:hep-lat/0208003].

E. Franco, V. Lubicz, F. Mescia and C. Tarantino
Lifetime ratios of beauty hadrons at the next-to-leading order in QCD
Nucl. Phys. B **633** (2002) 212, [arXiv:hep-ph/0203089].