

Marco Oliveira Pena Sampaio

Curriculum Vitae

PERSONAL DETAILS

NATIONALITY / DATE OF BIRTH: Portugal | 1st August 1983
ADDRESS: Rua das Luzes n 71, 3 Esquerdo Traseiras, 4400-207, Gaia, Portugal
CELLPHONE: +351964493917
EMAIL: msampaio@ua.pt
WEBPAGE: gravitation.web.ua.pt/msampaio

ACADEMIC EDUCATION

2006-2010 PhD in Particle Physics Phenomenology at high energy colliders,
Churchill College & Cavendish Lab. HEP group, Cambridge University, UK
"Hawking radiation from higher-dimensional black holes" | Supervisor: Prof. Bryan WEBBER

2005-2006 Master of Advanced Studies in MATHEMATICS (PART III MATHEMATICS),
Churchill College & DAMTP, Cambridge University, UK

2001-2005 University Degree in PHYSICS, **University of Porto, Portugal**
PROJECT: *"A study of the Casimir effect in curved space-time"* | Mark: **19/20**
OVERALL DEGREE MARK: **18/20**

2001 St. Maria Maior secondary school – Viana do Castelo, Portugal
NATIONAL EXAMS: Mark: **20/20**

WORK EXPERIENCE

Research Positions

JAN 2011 – present | Physics Department, UNIVERSITY OF AVEIRO, Portugal
Postdoc

JAN 2011 – JUL 2011 | CERN – THEORY DIVISION, Geneva, Switzerland
Visiting Scientist

JUNE 2010 – DEC 2010 | CENTRO DE FÍSICA DO PORTO, UNIVERSITY OF PORTO, Portugal
Postdoc

Teaching Assistant

2011 - 2014 | Physics Department, UNIVERSITY OF AVEIRO, Portugal

2007 - 2008 | Physics Department, UNIVERSITY OF CAMBRIDGE, UK

BIBLIOMETRICS

- Publication list (35): <http://inspirehep.net/author/profile/M.O.P.Sampaio.1>
- ORCID: orcid.org/0000-0001-9493-2770
- h-index 13; 614 citations (Feb 2017).

SELECTED PUBLICATIONS (SEE FULL LIST ATTACHED)

- J. E. Camargo-Molina, A. P. Morais, R. Pasechnik, M. O. P. SAMPAIO, J. Wessén, *All one-loop scalar vertices in the effective potential approach*, **JHEP 1608** (2016) 073.

- R. Costa, M. Mühlleitner, M. O. P. SAMPAIO, R. Santos, *Singlet Extensions of the Standard Model at LHC Run 2: Benchmarks and Comparison with the NMSSM*, **JHEP** **1606** (2016) 034.
- R. Costa, A. P. Morais, M. O. P. SAMPAIO, R. Santos, *Two-loop stability of a complex singlet extended Standard Model*, **Phys.Rev.** **D92** (2015) 2, 025024.
- P. M. Ferreira, R. Guedes, M. O. P. SAMPAIO, R. Santos, *Wrong sign and symmetric limits and non-decoupling in 2HDMs*, **JHEP** **1412** (2014) 067.
- F. S. Coelho, C. Herdeiro, M. O. P. SAMPAIO, *Radiation from a D-dimensional collision of shock waves: a remarkably simple fit formula*, **Physical Review Letters** **108** (2012) 181102.
- J. A. Frost, J. R. Gaunt, M. O. P. SAMPAIO, M. Casals, S. R. Dolan, M. A. Parker, B. R. Webber, *Phenomenology of production and decay of spinning extra-dimensional black holes at hadron colliders*, **JHEP** **10** (2009) 014.
- M. O. P. SAMPAIO, *Charge and mass effects on the evaporation of higher-dimensional rotating black holes*, **JHEP** **10** (2009) 009.

JOURNAL PEER REVIEWING

- THE EUROPEAN PHYSICAL JOURNAL C, Springer – *Impact Factor 2015: 4.90*
- INTERNATIONAL JOURNAL OF MODERN PHYSICS D, World Scientific – *Impact Factor 2015: 1.96*
- GENERAL RELATIVITY AND GRAVITATION, Springer – *Impact Factor 2015: 1.67*
- PROCEEDINGS IN MATHEMATICS & STATISTICS, Springer

DISTINCTIONS & PRIZES

- | | |
|-------------|--|
| JUN 2014 | WORLD SCIENTIFIC HIGHLIGHTS – <i>Special issue on Gravitational Waves & Cosmology</i>
Selection of lecture notes in the international spring school NR/HEP2 (see Sec. Pedagogical material) on gravitational radiation in particle collisions at the speed of light, highlighted with five contributions, from authors such as G. Smoot (Nobel in Physics), A. Linde e N.Turok.
www.worldscientific.com/page/Gravitational_Waves_Cosmological_Inflation |
| JUN 2012 | U. AVEIRO RESEARCH HIGHLIGHTS – <i>A remarkable and mysterious formula</i>
Selected article for the research highlights of the University of Aveiro – based on PRL 108 181102. |
| 2006 - 2009 | DOCTORAL FELLOWSHIP for research at the University of Cambridge
Fundação para a Ciência e Tecnologia, Portugal SFRH/BD/23052/2005. |
| 2004 | MARIE CURIE R. G. 51309 – Merit fellowship for student project, University of Porto
<i>A Study of the Casimir effect in curved space-time.</i> |

INVITED CONFERENCE TALKS & SEMINARS

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| FEB 2016 | SEMINAR, Lund University, Sweden
<i>Singlet extensions of the SM: Chain decays, benchmarks and radiative corrections</i> – partic-
le.thep.lu.se/Seminars/ |
| JUN 2015 | WORKSHOP, University of Crete, Greece, <i>Gravitational Radiation & Black Hole Formation in particle collisions</i>
<i>Radiation from a D-dimensional collision of shock waves: analytic vs numerical results</i>
hep.physics.uoc.gr/gravihepcosmo/Home.html |
| MARCH 2013 | LECTURER at the NR/HEP2 Spring School – IST, Lisboa
<i>Radiation from a D-dimensional collision of shock waves: numerical methods</i>
blackholes.ist.utl.pt/nrhep2 |
| APRIL 2012 | JORNADAS DO LIP – Pavilhão do conhecimento, Lisboa.
<i>ScannerS: A tool for extended scalar sectors</i>
indico.cern.ch/event/186952/ |
| OCT 2011 | SEMINAR, CENTRA – IST Lisboa
<i>Gravitational radiation from shock wave collisions in higher dimensions</i> |

- | centra.tecnico.ulisboa.pt/blackholes/seminars/sampaio.pdf
- JUN 2010 | TOOLS2010 WORKSHOP – Winchester UK.
CHARYBDIS2: Modelling higher dimensional black hole events
www.next-institute.ac.uk/TOOLS2010-StartPage.html
- MAY 2010 | SEMINAR, CFP – University of Porto
Beyond the Standard Model: Modelling Black Hole events @ LHC
faraday.fc.up.pt/cfp/events/seminars/beyond-the-standard-model-modelling-black-hole-events-at-the-lhc/?searchterm=cfp
- MAY 2009 | SEMINAR Cavendish Lab. HEP group, University of Cambridge
Modelling black hole events @ LHC – talks.cam.ac.uk/talk/index/15330

CONFERENCE PRESENTATIONS (SELECTION)

- DEC 2015 | Scalars 2015 WORKSHOP - University of Warsaw, Poland
Benchmark scenarios and resonant decays in singlet models at the LHC run 2
scalars2015.fuw.edu.pl
- SEPT 2015 | LHC HIGGS CROSS SECTION WORKING GROUP 3, BSM SCALARS - CERN, Switzerland
Benchmarks with a real or complex singlet scalar
indico.cern.ch/event/443289
- FEB 2015 | Higgs as a Probe of New Physics WORKSHOP - University of Toyama, Japan
Two-loop stability of singlet extensions of the SM with dark matter
jodo.sci.u-toyama.ac.jp/theory/HPNP2015
- SEPT 2014 | WORKSHOP on Multi-Higgs models, CFTC, University of Lisbon, Portugal
Constraining the parameter space of 2HDM models with Scanners
www.ciul.ul.pt/2hdmwork/index.php?n=Main.Program
- AUG 2012 | *Scanners: a scanning tool applied to singlet complex extensions of the SM*
www.ciul.ul.pt/2hdmwork/index.php?n=Main.2012Edition
- SEPT 2013 | SCALARS 2013, University of Warsaw, Poland
Scanners: New modules and interfaces to constrain multi-Higgs models
scalars2013.fuw.edu.pl
- SEPT 2012 | SPANISH RELATIVITY MEETING, University of Minho, Portugal
Second order D-dimensional shock wave perturbation theory
w3.math.uminho.pt/ERE2012
- JULY 2012 | 13TH MARCEL GROSSMANN MEETING, Stockholm, Sweden
D-dimensional shock wave perturbation theory at higher orders: Radiation extraction
www.icra.it/mg/mg13
- DECEMBER 2010 | BLACK HOLES WORKSHOP III, IV, V & VII, Univ. Minho, Aveiro & IST, Portugal
Hawking radiation from higher dimensional black holes
bhw3.wikidot.com
- 2011 | *Gravitational radiation from shock wave collisions in higher dimensions*
gravitation.web.ua.pt/?q=node/27
- 2012 | *Scattering and stability around charged black holes*
blackholes.ist.utl.pt/blackholes5
- 2014 | *Radiation from a D-dimensional Collision of shock waves: exact results*
gravitation.web.ua.pt/bhw7

CO-ORGANIZED CONFERENCES & MEETINGS

- SEP 2016 | ENAA XXVI: Encontro Nacional de Astronomia e Astrofísica
University of Aveiro, Portugal – gravitation.web.ua.pt/enaa2016

MARCH 2015	KICKOFF MEETING: Exploring Beyond the Standard Model Higgs Sectors University of Aveiro, Portugal – indico.cern.ch/event/375698
DEC 2014 DEC 2011	BLACK HOLES WORKSHOPS, University of Aveiro, Portugal gravitation.web.ua.pt/?q=node/27 gravitation.web.ua.pt/bhw7
APRIL 2014	IX IBERIAN COSMOLOGY MEETING, University of Aveiro, Portugal gravitation.web.ua.pt/ibericos2014

PARTICIPATION IN PROJECTS & NETWORKS

CERN PROJECTS, PORTUGAL:

- CERN/FP/123619/2011 & 116397/2010, [A. Onofre & R. Santos](#) – **Phenomenological Studies at the LHC**
- CERN/FP/116341/2010 [C. Herdeiro](#)– **Numerical relativity, black holes and high energy physics**
- CERN/FP/109306/2009 [C. Herdeiro](#) – CFP University of Porto

OTHER PROJECTS & NETWORKS:

- DAAD/FCT [M. Mühlleitner & R. Santos](#) – **Exploring Beyond the Standard Model Higgs Sectors**
- NRHEP-295189-FP7-PEOPLE-2011-IRSES [C. Herdeiro](#) – **Numerical relativity network**
- PTDC/FIS/116625/2010 [C. Herdeiro](#) – **Numerical Relativity and LHC phenomenology**
- PTDC/FIS/098025/2008 [C. Herdeiro](#) – **Numerical Relativity and the AdS/CFT correspondence**
- www.casimir-network.com [C. Herdeiro](#) – **Casimir energy network**

TEACHING EXPERIENCE & PEDAGOGICAL MATERIAL

2014	COMPLEMENTOS DE MECÂNICA E ELETROMAGNETISMO, University of Aveiro Physics degree lecture course – exercise classes gravitation.web.ua.pt/msampaio/Teaching.html
2011	TEMAS ATUAIS DE FÍSICA: RELATIVIDADE E PARTÍCULAS, University of Aveiro Physics degree lecture course on Special Relativity and Particle Physics with preparation of lecture notes, exercises & final exam – gravitation.web.ua.pt/msampaio/Teaching.html
2007-2008	THEORETICAL PHYSICS II, University of Cambridge Third year lecture course of the <i>Natural Sciences Tripos</i> on quantum mechanics – exercise classes
2007-2008	PART IA MATHEMATICS, University of Cambridge Third year lecture course of the <i>Natural Sciences Tripos</i> on mathematical methods – exercise classes
MARCH 2013	NR/HEP2: Numerical Relativity Spring School, IST Lisboa Pedagogical lecture notes on gravitational radiation in particle collisions at the speed of light, with example exercises and MATHEMATICA notebook codes, published in: Marco O. P. Sampaio, <i>Radiation from a D-dimensional collision of shock waves: numerical methods</i> , Int.J.Mod.Phys. A28 (2013) 1340019 blackholes.ist.utl.pt/nrhep2/?page=material
2012 - 2013	FREE COURSE ON QUANTUM FIELD THEORY, University of Aveiro Introductory lecture course on scalar field theory with online notes – gravitation.web.ua.pt/IQFT
2012	FREE C++ COURSE, University of Aveiro Hands on course on the programming language with lecture notes, exercises and example codes online – gravitation.web.ua.pt/index.php?q=CplusplusCourse

SUPERVISION OF THESES & PROJECTS

2011 – 2016	Co-supervision of the PhD of Mengjie Wang, University of Aveiro IDPASC – www.idpasc.lip.pt/LIP/thesis/index.php?opt=1&sec=2&id=129
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2015 – 2016	Co-supervision of the third year Physics Engineering project Thesis , of Ana Carvalho <i>Modelo Padrão da Física de Partículas: mecanismo de geração de massa e extensões no setor escalar</i>
2014 – 2015	Co-supervision of the research project of Raul Costa, CFTC, U. Lisbon Development of the SCANNERS tool for phenomenological studies in multi-Higgs models scanners.hepforge.org – arxiv.org/abs/1504.06421 – gravitation.web.ua.pt/index.php?q=node/443
2012 – 2013	Supervision of the third year Physics Engineering project Thesis , of Raul Costa <i>Charybdis++: Produção de eventos de buraco negro para o LHC</i> – gravitation.web.ua.pt/charybdispp
2010	Supervision of the research project of Mengjie Wang, University of Porto <i>Kerr black hole with a perturbative magnetic field: Transmission factors without separation of variables</i>

JURY IN THESES

- 2014: Jury member in the **PhD** viva exam of Flávio Coelho, University of Aveiro – *Radiation from a D-Dimensional collision of gravitational shock waves*.
- 2012: Main examiner in the viva exam of the first year essay of Juan Pedro Araque, as part of the **Doctoral Program MAP-FIS** (Universities of Aveiro/Porto/Minho) – *Search for same sign top quark pair production at LHC*.
- 2013: Main examiner in the third year Physics Engineering **Project thesis** of Eduardo Santana, *Estudo de modelos inflacionários do Universo*.
- 2013: Main examiner in the third year Physics **Project thesis** of Elodie Lopes, *Estados quase-ligados de um campo escalar no background de um buraco negro*.

OUTREACH

JULY 2014	ACADEMIA DE VERÃO, University of Aveiro Six hours of activities with high school students including: lectures on particle physics introductory topics, practical games with the simulation of the selection of Higgs events at the LHC (Hypatia software) & preparation of student presentations. Session titles (translated from Portuguese): <i>The fundamental interactions; Particle collision experiments; The Higgs boson; Searching for the Higgs</i> .
APRIL 2012	Presentation of the RESEARCH AREAS OF THE PHYSICS DEPARTMENT, U. of Aveiro Presentation for (prospective) high school students.
2006-2009	PHYSICS @ WORK, Cavendish Lab., University of Cambridge Demonstration: Cosmic rays in bubble and spark chambers for high school students.
MARCH 2007	MASTERCLASS, Cavendish Lab., University of Cambridge Presentation for high-school students: <i>Proton-Proton collisions @ LHC</i> .
DEC 2006	INSTITUTE OF PHYSICS event, Cavendish Lab. University of Cambridge Practical demonstrations on the Physics of waves for high-school students.
2005	WORLD YEAR OF PHYSICS, University of Porto Produced a calendar as celebration of the World Year of Physics 2005 and tour guided students through an exhibition on radioactivity.

ADMINISTRATIVE SKILLS

- ADMINISTRATOR of group webpages (gravitation.web.ua.pt), webpage design for conferences (gravitation.web.ua.pt/bhw7 and gravitation.web.ua.pt/ibericos2014) and computing resources management (gravitation.web.ua.pt/computing).
- SEMINAR ORGANISATION (Gr@v group, gravitation.web.ua.pt/?q=node/6 - 2011 & 2015): Management of webpages, visitor expenses, announcements, booking and audio-visual resources.

COMPUTATIONAL SKILLS

- Experienced programmer of C/C++, Fortran, Mathematica, Maple, shell scripting and LaTeX.
- Developer of scientific computation projects:
 - scanners.hepforge.org – C++ tool for studying the Physics of the Higgs sector beyond the Standard Model (collaboration with CFTC, Lisboa);
 - projects.hepforge.org/charybdis2: Event generator for strong gravity events in TeV scale theories beyond the Standard Model;
- Experience with various High Energy Physics (HEP) tool such as HERWIG/Herwig++, Pythia, LHAPDF, MicrOmegas, Superiso, Hdecay, HiggsBounds/Signals etc...
- Experience with html, css, javascript, basic web server and database maintenance (phpMyAdmin) and the drupal CMS.
- Experienced user of Unix (Linux and MacOSX) and Windows systems.

LANGUAGES

PORTUGUESE	Mother tongue
ENGLISH	Fluent Speech, reading and extensive writing skills.
FRENCH	Elementary speech and writing.

OTHER PRESENTATIONS AND SEMINARS

SEPT 2015	III Amazonian Simposium on Physics and V NRHEP Network Meeting , Belém, Pará Brasil <i>Radiation from a D-dimensional collision of shock waves: analytic vs numerical result</i> www.ufpa.br/ppgf/IIIASP2015.htm
JULY 2015	14th Marcel Grossmann meeting , Rome, Italy <i>Marginal Proca and Scalar clouds in Reissner-Nordström</i> (session BH4) <i>Exact results in gravitational shock wave collisions in D-dimensions</i> (session ES2) www.icra.it/mg/mg14
JULY 2015	IVth NRHEP Network meeting , Rome, Italy <i>Perturbative solutions vs Numerical evolution in gravitational shock wave collisions in D-dimensions</i> www.roma1.infn.it/teongrav/leonardo/nrhep/nrhep4.html
AUG 2012	Amazonian Workshop on Black Holes and Analogue Models of Gravity , Belém, Pará Brasil <i>Hawking radiation for higher spin fields at the LHC</i> www.ufpa.br/ppgf/IAWBHAMG2012.htm
AUG 2012	Seminar, University of S. Paulo <i>CHARYBDIS2: Black holes @ LHC and Hawking radiation</i> fma.if.usp.br/en/coloquio/charybdis2-black-holes-lhc-and-hawking-radiation
2012/2013	Gr@v Journal Clubs, University of Aveiro – Presentations with discussion: <i>Internal bremsstrahlung signatures from dark matter annihilation</i> <i>Stability analysis methods and the Emparan-Reall black ring</i> gravitation.web.ua.pt/events
APRIL & DEC 2010	CFP Journal Clubs, University of Porto – Presentations with discussion: <i>The effect of gauge charges on black hole evaporation at the LHC</i> <i>A look at the Higgs sector in the Standard Model and its simplest extension</i>
JUL 2008	New Trends in Particle Physics and Cosmology, Sheffield University <i>Phenomenology of black hole events in theories with extra dimensions</i> particle-theory.group.shef.ac.uk/si2008/index.php?page=home

- JAN 2008 | **Graduate Student Conference, Cavendish Lab, University of Cambridge**
Hawking radiation in models with extra dimensions
- DECEMBER 2005 | **Physics 2005, Faculty of Sciences, Porto University** (Sociedade Portuguesa de Física).
Poster: *The Casimir energy and a universe without big bang.*

PARTICIPATION IN OTHER CONFERENCES & WORKSHOPS

- MARCH 2014 | New frontiers in dynamical gravity workshop. Univ. Cambridge,
www.ctc.cam.ac.uk/activities/adsgrav2014
- JANUARY 2014 | Testing General Relativity with Astrophysical observations. Univ. Mississippi,
www.phy.olemiss.edu/TestGR2014
- DECEMBER 2012 | Third symposium on prospects in the physics of discrete symmetries. IST, Lisbon,
indico.cern.ch/event/202057
- SEPTEMBER 2011 | Numerical relativity and high energy physics. blackholes.ist.utl.pt/nrhep, IST Lisbon
- SEPTEMBER 2009 | Parma International School of Theoretical Physics, University of Parma, Italy.
- MARCH 2008 | MC4BSM – Monte Carlo Tools for Beyond the Standard Model Physics, CERN.
- JANUARY 2008 | UK HEP Young Experimentalists and Theorists Institute, University of Durham.
- SEPTEMBER 2007 | British Universities Summer School in Theoretical Elementary Particle Physics, York University
- APRIL 2007 | MCNet school *Physics and Techniques of Event Generators*, University of Durham.
- NOVEMBER 2006 | High Energy Physics in the LHC Era, LPNHE Paris.

COMPLETED ONLINE COURSES

- *Machine Learning* – [coursera.org syllabus](https://www.coursera.org/syllabus)
- *The Data Scientist's Toolbox* – [coursera.org syllabus](https://www.coursera.org/syllabus)
- *Introduction to Meteor.js Development* – [coursera.org syllabus](https://www.coursera.org/syllabus)
- *Responsive Web Design* – [coursera.org syllabus](https://www.coursera.org/syllabus)
- *Responsive Website Basics: Code with HTML, CSS, and JavaScript* – [coursera.org syllabus](https://www.coursera.org/syllabus)
- *Codecademy courses: Python, SQL, Javascript, jQuery, PHP* – [profile at www.codecademy.com/marcoopsampaio](https://www.codecademy.com/marcoopsampaio)

OTHER ACTIVITIES & INTERESTS

- Treasurer, *Churchill College Volleyball Club* (2009).
- Athlete in *Cambridge University Volleyball Blues* (first University team 2008-2009).
- Second team captain, *Cambridge University Volleyball* (2008).
- Selected for the under-16 Volleyball Portuguese National Team (1998).
- Interest in music. Violin lessons from 9 to 13 years old.
- Interested in amateur astronomy, cinema, literature and sports in general.