

Prof. Dr. Benjamin Koch

CONTACT

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RESEARCH INTERESTS

Gravitation And Particles (GAP)

Quantum gravity phenomenology
Renormalization group and asymptotic safety
Physics beyond the standard model
Weakly interacting particles

WORKING EXPERIENCE

Since 2015, Associate professor

At: Pontificia Universidad Católica de Chile, Santiago, Chile

2012-2015, Assistant professor

At: Pontificia Universidad Católica de Chile, Santiago, Chile

2014, External consultant

On: Ballistics for Carabineros de Chile

2008-2011, Postdoc

At: Pontificia Universidad Católica de Chile, Santiago, Chile

2007-2008, Postdoc

At: Johann Wolfgang Goethe University in Frankfurt, Germany

2004-2007, Teaching assistant

At: Johann Wolfgang Goethe University in Frankfurt, Germany

2001, Internship

On: Simulation and construction of a water Cherenkov detector

At: Max Planck Institute for Physics in Munich, Germany

1996-1997, Civilian service

At: Lebenshilfe Nördlingen, Germany

TEACHING
EXPERIENCE

Ongoing supervision of undergraduate and postgraduate students

Since 2017-bachelor	Sebastian Nuñez on “Geodesic Structure of Black Holes with Scale Dependence”
Since 2017-master	Rene Araneda on “Gravitational Stern Gerlach experiments”
Since 2017-master	Cristobal Laporte on “Variational Parameter Setting in Asymptotic Safety”
Since 2016-PhD	Angel Rincon on “Scale dependence in gravitational theories”
Since 2015-PhD	Cristopher Gonzalez on “Hidden photons in cosmology”
Since 2014-PhD	Ignacio Reyes on “Higher spin black holes”

Completed supervision of undergraduate and postgraduate students

2016-PhD	Nicolas Zalaquett on “Spinning particles in general relativity”
2016-master	Christian Diaz on “Hidden photons in the Casimir effect”
2016-bachelor	Cristobal Laporte on “Variational parameter setting in QED”
2016-bachelor	Juan Antonio Paredes on “Dark matter annihilation in the galactic center”
2015-master	Paola Rioseco on “Black holes and running couplings”
2015-bachelor	Javier Felipe Nunez on “Spinning massive particles in cosmology”
2015-internship	Victor Munoz on “The path integral formulation of quantum mechanics”
2014-master	Esteban Castillo on “QFT in time-dependent backgrounds”
2014-master	Ignacio Reyes on “Differentiable-path integrals in quantum mechanics”
2014-bachelor	Jose Taulis on “Black holes as particle accelerators”
2014-bachelor	Hernan Cabrera on “Geoneutrinos at the ANDES underground laboratory”
2014-internship	Alejandro Contreras on “How to throw a basketball?”
2013-internship	David Valenzuela on “Black hole analog in soap film?”
2013-internship	Antonio Henriquez on “Symmetries in physics”
2012-internship	Cristobal Armaza on “The spinning top in general relativity”

Teaching at Pontificia Universidad Católica

2017-II	Electrodynamics & Electricity and Magnetism
2017-I	General Physics
2016-II	Electricity and Magnetism & Thermodynamics & QFT II
2016-I	Introduction to Renormalization Group (at UNAB school)
2015-II	Electricity and Magnetism for Physicists and Engineers
2015-I	Quantum Field Theory II
2014-II	Electrodynamics & Thermodynamics for Engineers
2014-I	Advanced Quantum Mechanics & Introduction to Particle Physics
2013-II	Modern Physics
2013-I	Modern Physics & General Physics for College

2012-II Electricity and Magnetism for Engineers
2012-I General Physics for College

2011-II Electricity and Magnetism
2011-I General Physics for Engineers

2010-II Introduction to Particle Physics
2010-I Introduction to Physics

2009-II Introduction to Physics
2009-I Quantum Field Theory I

2008-II Introduction to Particle Physics

Teaching assistant at University of Frankfurt

2007-I Statistical Physics
2006-I Quantum Mechanics I
2005-I Elektrodynamics
2004-II Theoretical Mechanics II
2004-I Theoretical Mechanics I

EXTERNAL
FUNDING

2016-2017, Principal organizer, VRA funds for workshops and seminars
Graviticulas seminar series

2016-2018, Co-investigator, Fondecyt Regular 1161150
Looking for signatures of a hidden sector

2012-2016, Principal investigator, Fondecyt Regular 1020360
Theory and Phenomenology at the Terascale

2012-2016, Senior researcher, Anillo ACT1102
Anillo Atlas Andino - High Energy Particle Physics

2015, Co-Luksic grant for collaboration between University of Notre Dame and PUC
Organization the Chilean LHC Masterclasses 2016

2014, Co-Luksic grant for collaboration between University of Notre Dame and PUC
Organization of a combined workshop and of the Chilean LHC Masterclasses 2015

2014, External funding of Swiss Embassy
Invitation in context of honorary doctorate for Peter Jenni (ATLAS)

2013, Co-Luksic grant for collaboration between University of Notre Dame and PUC
Organization of the Chilean LHC Masterclasses 2014

COMMISSIONS
OF TRUST

Reviewing activity for the following journals

General Relativity and Gravitation
Nuclear Physics B
Physics Letters B
Foundations of Physics
European Physics Letters
Universe
European Physical Journal C

Reviewing activity for the following programs

Conicyt Formation of Human Capital
Swiss School Santiago, Matura
Fondecyt Regular
Fondecyt Incerción

OUTREACH **2014-2017, Leading organizer of first chilean LHC masterclasses**

Several TV and newspaper interviews

LANGUAGES **German:** native language

English: fluently

Spanish: fluently

Latin: reading only

EDUCATION **2007, PhD**

Title: Black hole production and graviton emission
in models with large extra dimensions
At: Frankfurt International Graduate School of Science and
Johann Wolfgang Goethe University in Frankfurt , Germany

2003, Diploma

Title: Einschleifenrechnungen zur tiefinelastischen
Neutrino-Nukleon-Streuung im MSSM
At: Max Planck Institute for Theoretical Physics, and
Technical University Munich, Germany

2001, One semester Erasmus exchange program

At: Universidad de Complutense in Madrid, Spain

1996, School leaving examination (Abitur)

At: Theodor Heuss Gymnasium Nördlingen, Germany

OTHER INTERESTS Gymnastics, guitar, and hiking

Santiago, July 18, 2017