



# UNIVERSITÀ DEGLI STUDI DELL'AQUILA

**Prof. Luigi Pilo**

## **Curriculum scientifico**

(Aggiornato il 4/10/2016)

•

Name and Surname: Luigi Pilo

•

Date and place of birth: July 24, 1967 Alghero (SS) Italy

•

Citizenship: Italian

•

Phone: +39 0862 433057 Fax: +39 0862 701983

•

Mobile: +39 3333234437 E-mail: Luigi.Pilo@aquila.infn.it

•

Homepage: [www.aquila.infn.it/lpilo/Luigi Pilo Homepage/Home.html](http://www.aquila.infn.it/lpilo/Luigi_Pilo_Homepage/Home.html)

### Qualifications

•

Present position: Associate Professor at the Department of Physics, University of LAquila.  
Research fellow of LNGS (Gran Sasso National Laboratory), INFN (National Institute for Nuclear Physics).

•

National Scientific Habilitation (ASN) as associated professor in theoretical physics

(link to ASN webpage: <http://abilitazione.miur.it/public/index.php?lang=eng>), January 2014.

- PhD in Theoretical Physics awarded by Scuola Normale Superiore of Pisa, November 1997.  
Title of the PhD thesis: Chern-Simons field theory and invariants of 3-manifolds. Supervisor: Prof. E. Guadagnini. Examiners: F. Bassani, S. Caracciolo, L. Castellani, E. Guadagnini, P. Menotti, R. Stora, F. Strocchi.
- Master Degree in Physics awarded by the University of Pisa, June 1993. Title of the 1-year-thesis based on theoretical studies: Chern-Simons theory with gauge group  $SU(3)$  and invariants of three-manifolds. Supervisor: Prof. E. Guadagnini.

## Research experience

- February 2016 - present Associated professor at the Department of Physical and Chemical Sciences, University of LAquila
- April 2005-January 2016 Assistant professor at the Department of Physical and Chemical Sciences, University of LAquila
- October 2003-April 2005: 2+2 years post-doctoral position at National Institute for Nuclear Physics (INFN), Padova (Italy) section.
- October 2001-September 2003: 2-year post-doctoral position at Service de Physique Th eorique CEA/Saclay, Paris (France).
- July 1999-October 2001: 2-year post-doctoral position at Scuola Normale Superiore di Pisa, Pisa (Italy).
- January 1998-December 1998: Visiting scientist at Department of Applied Mathematics and Theoretical Physics of Cambridge (UK). Supported by a grant from the Angelo Della Riccia Foundation (Florence).

- January 1997-October 1997: Visiting scientist at the Department of Physics, Davis University of California (USA). Supported by a joint grant from Scuola Normale Superiore di Pisa and University of California.

- December 1993-December 1996: PhD fellowship at Scuola Normale Superiore in Pisa (Italy).

Academic duties and responsibilities

- Research fellow at National Gran Sasso Lab (LNGS).

- Local coordinator of INFN national research group in Dark (Inflation, Dark Matter and the Large-Scale Structure of the Universe).

- Member of the Selection Committee for PhD studentships at the Department of Physical and Chemical Sciences, University of L'Aquila, Italy.

- Member of the Selection Committee for INFN postdoc positions in Theoretical Physics at Gran Sasso National Lab (LNGS), Italy.

- Member of the Physics Doctoral School Committee of the Department of Physical and Chemical Sciences, University of L'Aquila, Italy.

- Referee for the following journals: Physical Review D, Physical Review Letters, Journal of High Energy Physics, Journal of Cosmology and Astroparticle Physics, General Relativity and Gravitation, Physics Letters B, Annalen der Physik, Classical and Quantum Gravity.

- 

Invited professor in the following institutions: CERN Theoretical division, Geneva Cosmology and Astroparticle group, Scuola Normale Superiore di Pisa, ICTP Trieste, GGI Firenze, LPT Orsay, Aspen Center for Physics, Los Alamos National Laboratory.

Funding received

- 

2014-2015: Grant for INFN national research group inDark (Inflation, Dark Matter and the Large-Scale Structure of the Universe), as local coordinator at Laboratori Nazionali del Gran Sasso, Italy. National budget: 147.000 euro; local budget: 7000 euro; duration: 24 months.

- 

Grants from Italian Ministry of Education as participant to the following national research programs PRIN (Program of Scientific Research of National Interest):

? 2006-2008: National project Astroparticle Physics: neutrinos and primordial Universe funded by the Italian Ministry of Research and Education (PRIN 2006). National budget: 160.500 euro; local budget: 45.200 euro; duration: 24 months.

? 2010-2012: National project Astroparticle Physics: neutrinos and the dark side of the Universe funded by the Italian Ministry of Research and Education (PRIN 2010). National budget: 155.620 euro; local budget: 34.108 euro; duration: 24 months.

? 2014-2017: National project Theoretical Astroparticle Physics funded by the Italian Ministry of Research and Education (PRIN 2014). National budget: 426.801 euro; local budget: 53.350 euro; duration: 3 years.

? Grant for a postdoc position at INFN Padova from UniverseNet, Marie Curie Research Training Network supported by the European Community. Budget: about 40.000 euro, duration: 48 months.

- 

Grant from Angelo Della Riccia Foundation to encourage young scientist to conduct research in prestigious foreign institutions. Visiting scientist at Department of Applied Mathematics and Theoretical Physics of Cambridge (UK).

- 

Grant from Scuola Normale Superiore and University of California to encourage young scientist to conduct research among the two institutions. Visiting scientist at the Department of Physics, Davis University of California (USA).

## Supervising and mentoring activities

- 

Phd students, University of L'Aquila:

- 

S. Fattori 2011 (co-advisor), R&D for the XENON1T module of the XENON Dark Matter Search Experiment.

- 

V. Caracciolo 2012 (co-advisor), Feasibility study for an experiment on the neutrino-less double beta decay modes of  $^{106}\text{Cd}$

- 

P. Zavarise 2013 (co-advisor), Analysis of the first data of the GERDA experiment at LNGS.

- 

M. Crisostomi, 2014 (advisor), Massive Gravity, International Doctorate on AstroParticle Physics (IDAPP) and University of L'Aquila (link: [www.fe.infn.it/idapp](http://www.fe.infn.it/idapp)).

- 

A. Parisi, 2016 (advisor),

- 

Phd students from other institutions:

? Marco Celoria 2015 (advisor), Gran Sasso Science Institute (Gran Sasso Science Institute).

- 

Graduate students, University of L'Aquila:

- 

M. Crisostomi 2011 (advisor), Modification of gravity at large dis-

tances

- S. Menna 2013 (advisor), Gravitational radiation and the graviton mass
- A. Breccione Mattucci 2015 (advisor), The Higgs boson and S matrix tree level unitarity in the Standard Model.

? F. Tonelli 2015 (coadvisor), Torsional oscillations of strange stars ? Undergraduate students, University of L'Aquila:

- E. Pacilli 2008 (advisor), Feynman integral in quantum mechanics
- N. Bulso 2009 (advisor), Quantization of the electromagnetic field
- J. Ferrara 2015 (advisor), Photoelectric effect and Quantized EM Field

Teaching

Lectures given at University of L'Aquila, Italy:

- Undergraduate courses:  
mathematical methods of physics: academic years 2003-2004, 2004- 2005, 2006-2007, 2016-2017.  
quantum mechanics: academic years 2008-2009, 2009-2010, 2014- 2015, 2015-2016.
- Graduate courses:  
classical electrodynamics: academic years 2003-2004, 2013-2014.  
gauge theories: academic years 2006-2007, 2007-2008, 2009-2010, 2015- 2016, 2016-2017.  
theoretical physics: academic years 2009-2010, 2013-2014, 2014-2015. particle physics: academic years 2007-2008, 2010-2011, 2011-2012.

- 

PhD courses:

basic cosmology: academic year 2010-2011.

Recent invited presentations to international conferences and schools

- 

HEP 2011, Grenoble (France). July 2011. Bigravity as a tool for massive gravity.

- 

Theoretical Physics in Cortona (Italy). May 2012. Deforming gravity.

- 

Hot topics in Modern Cosmology. May 2012 Cargese (France). Recent Developments in Massive Gravity.

- 

Tales of Lambda; Nottingham (UK). July 2013. General massive gravity and cosmology.

- 

GR20, 20th international conference on general relativity and gravitation, Warsaw (Poland). July 2013. Weakly coupled massive gravity.

- 

Extended Theories of Gravity, NORDITA, Stockholm (Sweden). March 2015. Invited talk: Fluids and Gravity.

- 

14th Marcel Grossmann Meeting, Rome (Italy). March 2015. Recent Results in Massive Gravity. Massive Gravity and Self-gravitating Fluids.

-

Gravity @ all Scales, Nottingham (UK). August 2015. Invited talk: Massive gravity as a self gravitating medium.

- Split School of High Energy Physics, Split (Croatia). September 2015. Invited lecturer on Cosmology.

- GR21, Columbia University New York (USA). July 2016. Self gravitating medium and modified gravity.

Recent invited seminars

- November 2013, APC, Paris (France). The cosmological side of Massive gravity.

- November 2013. LPT, Orsay (France); Cosmology in Massive Gravity.

- April 2014, Department of Physics, University of Geneva (Switzerland);  
The Cosmological side of Massive Gravity.

- May 2014, Department of Physics, University of Padova (Italy); Massive Gravity.

- November 2014, Department of Physics, University of Milano Bicocca (Italy); Massive Gravity.

- February 2015, Institute of Cosmology and Gravitation, Portsmouth (UK); Massive Gravity.

- June 2016, Laboratoire Astroparticule & Cosmologie (APC), Paris (France); Thermo-Dynamics of self gravitating media.

Prizes and awards



- 

Prize for the publication of the Phd Thesis on the Publications of the Scuola Normale Superiore of Pisa, Springer, 1999.

Organisation of International Conferences and Schools

- 

Member of the Local Organising Committee of the ISAPP Summer School Gran Sasso Summer Institute 2014 at Laboratori Nazionali del Gran Sasso. [link](#).

- 

Member of the Local Organising Committee of the Gran Sasso Summer Institute on Theoretical Physics 11th Summer Institute at Gran Sasso National Laboratory. Assergi, July 2005. [link](#).

- 

Member of the Local Organising Committee of the Gran Sasso Summer Institute on Theoretical Physics 10th Summer Institute at Gran Sasso National Laboratory. Assergi, July 2006. [link](#).

- 

Member of the Local Organising Committee of the Gran Sasso Summer Institute on Theoretical Physics 13th Summer Institute at Gran Sasso National Laboratory. Assergi, July 2008. [link](#)

Outreach activities

- 

Member of the scientific committee of Scienze e Ricerche. [link](#)

- 

Assigned by the Italian Association of the Book as member of the committee awarding the "National prize for contributing to the public understanding of science" for the best book.  
[link](#)

- 

Scientific guide for the Laboratori Nazionali del Gran Sasso, INFN Italy.

- Organizer of the outreach scientific activities for the Gran Sasso Open Day, since many years.
- Organizer of the outreach scientific activities for the University of L'Aquila Open Day, since many years.

## Research interests

- Gravity and cosmology: quantum black holes, effective theories and extra dimensions, Gws and inflation, massive gravity, modified gravity and cosmology of modified gravity theories, bigravity, cosmological perturbations.
- Physics beyond the standard model: mechanism for spontaneous symmetry breaking, Higgsless models, gauge theories in extra dimensions, gravitational effects in theories with large extra dimensions.
- Quantum field theory: Cherns-Simons topological field theory in 3d, anomalies in theories with extra dimensions, localisation in field theory.
- Papers on inspire <http://inspirehep.net/search?p=find+a+pilo,+l>.