

**CRISTIANO GALBIATI**

364 JADWIN HALL - WASHINGTON ROAD  
PHYSICS DEPARTMENT OF PRINCETON UNIVERSITY  
PRINCETON, NEW JERSEY 08540

**CURRICULUM VITAE ET STUDIORUM**

**EDUCATION**

- 1995-99      Università degli Studi di Milano, Dottorato di Ricerca in Fisica.  
1998         Marina Militare Italiana, Naval Academy Livorno, Officer Course.  
1990-95      Università degli Studi di Milano, Laurea in Fisica.

**APPOINTMENTS**

- 2018-         Gran Sasso Science Institute, Full Professor.  
2014-         Princeton University, Full Professor with Tenure.  
2010-14      Princeton University, Associate Professor with Tenure.  
2002-10      Princeton University, Assistant Professor.  
2001-02      Princeton University, Instructor.  
2000-01      Princeton University, Lecturer.  
1999-2000    Princeton University, Research Associate.  
1998-99      Marina Militare Italiana, MARIPERMAN La Spezia, Ensign.

**CERTIFICATIONS**

- 2014         Abilitazione Scientifica Nazionale a Professore di Prima Fascia, Settore 02/A1, Fisica Sperimentale delle Interazioni Fondamentali.

**HONORS**

- 2016         Visiting Scientist, Université Paris Diderot.  
2016         Visiting Scientist, Università degli Studi di Cagliari.  
2009-10      URA-FNAL, Visiting Scholar Fellow.  
1999-2001    Postdoctoral Fellow of Istituto Nazionale di Fisica Nucleare (INFN), at Princeton University.  
1995         Visiting Scientist, Laboratory of Nuclear Sciences, MIT.  
1994-95      Undergraduate Fellow, Istituto Nazionale di Fisica Nucleare (INFN), at Laboratori Nazionali del Gran Sasso (LNGS).

**EXPERIMENTS and COLLABORATIONS**

- 2008-         DarkSide, Collaborator, Principal Investigator, and Spokesperson.  
2012-16      Borexino, co-Spokesperson.  
2011-12      WARP, Spokesperson.  
2008-13      MAX, Principal Investigator and Project Board member.  
2007-11      Borexino, Data Validation Committee, member  
2007-11      Borexino, Conferences Committee, member.  
2005-11      Borexino, Steering Committee, member.  
2005-12      WARP, Principal Investigator.  
2004-06      SAUND, Collaborator.  
1994-         Borexino, Collaborator.

**Cristiano Galbiati - Curriculum Vitae et Studiorum**

**PROFESSIONAL SERVICES and MEMBERSHIPS**

2017-20 Fermilab Long Baseline Neutrino Committee (LBNC), Member.  
2013- Laboratorio Subterráneo de Canfranc Scientific Committee,  
Member.  
2013-17 Fermilab Physics Advisory Committee (PAC), Member.  
2012-13 Snowmass 2013, Cosmic Frontier Working Group Convener.  
2008- Società Italiana di Fisica, Member.  
2007- Office of Nuclear Physics, Office of Science, Department of  
Energy.  
2005- American Physical Society, Member.  
2004 APS Multidivisional study of Neutrino Physics, Working Group  
on Solar and Atmospheric Neutrino Experiments, member.

**REFEREEING**

2017- Deutsche Forschungsgemeinschaft, Germany.  
2017- L'Agence Nationale de la Recherche, France.  
2013- Agencia Nacional de Evaluación y Prospectiva, Spain.  
2007- National Science Foundation, USA.  
2007- Department of Energy, USA.  
2005- Comitato di Indirizzo per la Valutazione della Ricerca, Italy.

**RESEARCH INTERESTS**

Solar and Supernova Neutrinos; Dark Matter; Double Beta Decay; Nucleon Decay;  
Low-Counting Experiments and Radioactive Background; Ultra-High Energy Cosmic  
Rays and Neutrinos.

**PERSONAL DATA**

US and Italian citizen, married, two sons.

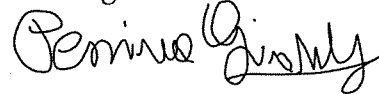
Princeton, NJ  
Monday, November 26, 2018  
Cristiano GALBIATI



Gianluigi Ezio Pessina CV (2018)

Gianluigi Ezio Pessina è Dirigente Tecnologico presso la Sezione INFN (Istituto Nazionale di Fisica Nucleare) di Milano Bicocca e professore di Elettronica Applicata (a contratto) presso la Facoltà di Fisica dell'Università di Milano Bicocca. Durante la sua carriera, iniziata più di 30 anni fa, ha lavorato (e sta lavorando) allo sviluppo di sistemi di front-end e rivelatori di particelle per esperimenti con e senza acceleratori. Ha sperimentato quasi tutti i campi tecnologici dell'Elettronica: Elettronica criogenica in silicio, GaAs e SiGe, Elettronica monolitica in GaAs, Silicio, CMOS bipolare, SiGe e HEMT. Lavora / ha lavorato con rivelatori criogenici, principalmente bolometri, camere a gas, rivelatori al Germanio e Silicio, Fotomoltiplicatori e SiPM (Silicon PhotoMultiplier). Realizza/ ha realizzato il front end di numerosi esperimenti e ha fornito report in oltre 90 riunioni di collaborazione. Gianluigi Ezio Pessina risulta autore / coautore di oltre 500 documenti pubblicati su riviste internazionali, atti di convegni e relazioni interne. Gianluigi Ezio Pessina sul web: <http://pessina.mib.infn.it>, [orcid](#), [scopus](#).

Gianluigi Ezio PESSINA

A handwritten signature in black ink, appearing to read 'Pessina Gianluigi', written in a cursive style.

Giuliana Fiorillo  
Dipartimento di Fisica "Ettore Pancini"  
Università degli Studi di Napoli "Federico II"  
INFN Sezione di Napoli  
e-mail: giuliana.fiorillo@na.infn.it

## Curriculum Vitae

### EDUCATION:

1995 PhD in Physics, Federico II University, Napoli, Italy  
1990 Laurea in Fisica, Università degli Studi di Napoli "Federico II"

### PROFESSIONAL AND ACADEMIC CAREER:

Since 2014 Associate Professor, Federico II University, Napoli Italy  
2001 – 2014 Assistant Professor, Federico II University, Napoli, Italy  
1996 – 2001 Researcher, Federico II University, Napoli, Italy  
1995 – 1996 Research fellow, INFN, Italy  
1995 Research fellow, Istituto di Cosmogeofisica, CNR, Torino, Italy  
1991 – 1994 PhD student at the Federico II University, Napoli, Italy  
1990 – 1991 Visiting Scientist, CERN, Geneva, Switzerland

### CAREER BREAKS:

2 children, born in 1996 and 1999

### CERTIFICATIONS

Abilitazione Scientifica Nazionale a Professore di Prima Fascia, Settore 02/A1, Fisica Sperimentale delle Interazioni Fondamentali.

### RESEARCH INTERESTS

Particle astrophysics, dark matter detection, neutrino physics, experimental elementary particle physics.

INTERNATIONAL RESEARCH PROJECTS: DARKSIDE, RED, T2K, SCENE, DARWIN, WARP, ICARUS, OPERA, CHORUS, CHARM II

ORCID: <http://orcid.org/0000-0002-6916-6776>

### COORDINATION OF SCIENTIFIC PROJECTS (PI or Co-PI):

- 2016 – now **ARIA**, "Progetto Premiale FOE 2015", co-Principal Investigator.
- 2014 – now **RED** experiment, Recoil Directionality in Liquid Argon, Principal Investigator.
- 2011 – now **DARKSIDE** experiment at LNGS, Dark Matter search with Depleted Argon.  
Deputy Spokesperson, since 2016. National PI for INFN, since 2013. Napoli group leader. Member of the Executive Board. Coordinator of the 1-ton prototype project. Chair of the Speakers Board (2014-2016). Member elected of the Steering Committee (2012-2014). Project leader of the cryogenic photo sensors WG (2011-2013).
- 2011 – 2013 **SCENE** experiment at Notre Dame, Measurement of scintillation and ionization yield of nuclear recoils in liquid argon and xenon with a compact, two-phase TPC, co-Principal Investigator.
- 2009 – 2013 **DARWIN** project, EU FP7-ASPERA Design study on a next-generation noble liquid dark matter facility in Europe. National PI for INFN. Napoli group leader. Member of the Executive Board and of the Project Management Group. WP leader for the light read-out.

- 2005 – 2007 PRIN 2005, Napoli Federico II University group leader
- 2003 – 2005 PRIN 2003, Napoli Federico II University group leader
- 2003 – 2011 **WARP** experiment at LNGS, Search for dark matter with the Wimp Argon Programme.  
Napoli group leader. Member of the Executive Board. Project leader for the photomultipliers of both the TPC and the VETO detector of WARP-140 experiment.
- 2002 – 2013 **ICARUS** experiment at LNGS, Study of neutrinos from solar, atmospheric and astrophysical origin, neutrinos from long baseline accelerator beams, proton decay.  
Co-founder and manager of the Napoli cryogenic laboratory. Project leader for the Supernova trigger.

#### SCIENTIFIC COMMITTEES, STEERING AND ADVISORY BOARDS

- 2018 – 2020 CERN, SPS and PS Experiments Committee (SPSC), Member
- 2017 – now TIFPA, Trento Institute for Fundamental Physics and Applications, Steering Group for the coordination of collaborative activities between INFN and FBK (Fondazione Bruno Kessler), Member
- 2015 – 2019 INFN Astroparticle National Scientific Committee (CSN2), Napoli and Salerno groups Coordinator elected
- 2013 – 2014 Federico II University Physics Department, Scientific Evaluation Committee, Member
- 2013 – 2014 Federico II University, Project Genovate: Transforming organizational culture for gender equality in research and innovation (FP7-Science-in-Society-2012-1), Institutional Board Chair
- 2013 – 2014 Federico II University, Polytechnic and Basic Sciences School Steering Board, Member elected
- 2013 – 2014 Federico II University Physics Department, Executive Board, Member elected
- 2008 – 2013 Federico II University, Academic Senate, Member elected
- 2004 – 2013 Federico II University, Physics Department, Teaching Steering Board, Member elected
- 2004 – 2008 Federico II University, Faculty of Mathematical, Natural and Physical Sciences Executive Steering Board, Member elected
- 2001 – Various faculty search, graduate student admission, PhD evaluation, postdoc, researcher and other selection committees, Member or President.

#### TEACHING AND ADVISING DUTIES

Several General Physics, Laboratory and Electronics courses for students of Physics, Engineering, Informatics.  
Astroparticle Physics lectures in PhD courses and International Schools.  
Advisor of 20 undergraduate students and 9 PhD thesis. Several of my former students currently hold a position in research and Academy.

#### SCIENTIFIC TRACK RECORD:

My scientific activity concerns Astroparticle and Neutrino Physics and includes R&D on particle detectors.

From 1989 to 1996 I was at CERN collaborating to **CHARM-II** and **CHORUS** experiments. My PhD thesis was devoted to the construction, test and calibration of the CHORUS electromagnetic calorimeter.

Neutrino oscillation searches at accelerators were my prevalent activity until 2002. I was Analysis Coordinator for the CHORUS phase 2 oscillation search and author of a review article on the CERN neutrino experiments at the major international conference of the field, the "International Conference on Neutrino Physics and Astrophysics". I am now continuing this research in the **T2K** experiment.

Starting from 2002 I focused on astroparticle physics, by joining the **ICARUS** collaboration and by setting up at Napoli a laboratory with cryogenic facilities for the development of the liquid argon (LAr) technology. For this activity I was awarded grants from MIUR (PRIN2003 and PRIN2005).

Under the leadership of the Nobel laureate Carlo Rubbia I joined a new challenging program aimed at the detection of galactic dark matter in the form of WIMPs (Weakly Interacting Massive Particles). I participated and led the Napoli group in the pioneering **WARP** experiment at LNGS, starting as an R&D with the realization of a prototype two-phase argon Time Projection Chamber, 3.2 kg in mass. This device allowed us to establish the feasibility of the technique for dark matter

search and to take physics data underground at LNGS. No WIMP events were observed in an accumulated exposure of 100 kg×day, the first result obtained with an argon target.

The next step was an experiment based on a factor 100 larger mass detector with respect to WARP-3.2, and the additional unique feature of being equipped with an active veto for neutrons. After the unfortunate tentative of building a 140 kg TPC inside an 8 tonne LAr volume, I joined in 2010 the **DarkSide** Collaboration in a new staged program for direct WIMP detection in LAr. My group has collaborated to the construction and run of the DS-10 prototype and of the DS-50 detector, running a 50 kg LAr TPC with argon from underground sources and therefore depleted of cosmogenic radionuclides. This experiment now leads the world search for low mass WIMPs and has demonstrated the capability to perform a “zero-background” search for high mass ones, setting the stage for a discovery program for dark matter through the “neutrino floor” boundary.

In the same period, I promoted and was the Italian PI of a European project to develop the two phase noble liquid technique for high sensitivity dark matter searches. Funded under the FP7 ASPERA program, the **DARWIN** project was carried out by an international collaboration of 7 INFN groups, 10 European institutes and 4 American universities. Among the activities supported by the project, the small and successful **SCENE** experiment, that reported the important observation of an electric field dependence of scintillation light from low energy nuclear recoils in LAr and hints for its directional sensitivity.

Additionally, I conducted several studies on cryogenic photosensors and alternative light readout for the noble liquids (VSIPMT, SIGHT and SiPM R&D projects).

My group made a prominent contribution to the R&D activity on the Silicon Photomultipliers as possible candidates to substitute the PMT in next generation LAr detectors for dark matter searches that has led to one of the key innovations of the proposed DS-20k detector, 20 tons in fiducial mass, that could be operated by 2022. At present I am the National Representative of the 15 Italian **DarkSide** groups and Deputy Spokesperson of the international collaboration counting 350 researchers from over 70 different institutions.

Within the **DarkSide** experimental program, I lead the effort towards the realization of a 1-ton prototype detector. I am also co-PI of the **ARIA** project for argon purification (“Progetto Premiale FOE 2015”).

Finally, since 2014 I lead the **ReD** Experiment, a neutron beam experiment running a small LAr chamber with SiPM readout. The experiment will perform detailed studies on scintillation and ionization in LAr with the goal of investigating the sensitivity to nuclear recoil direction.

#### SUMMARY OF PUBLICATIONS:

I authored or co-authored more than 180 papers, 159 of them citeable (published or arXiv).  
An h-index of 42 is calculated by <http://inspirehep.net/> on 2018-08-02.

#### INVITED TALKS, SEMINARS, COLLOQUIA, CONFERENCE ORGANIZATION

Invited speaker for plenary talks in about thirty International Conferences.  
Invited to give tens of scientific seminars and colloquia to a larger audience.  
Organizer of several International Workshops, chair or convener of Astrophysics sessions at International Conferences.  
Co-editor of the *XVI International Workshop on Weak Interaction and Neutrinos Proceedings*.

#### PEER REVIEW ACTIVITIES

Referee of CERN SPSC for PROTODUNE-DP (NP02), PROTODUNE-SP (NP04), CLOUD, UA9, NA62 Experiments.  
Referee of INFN CSN2 for SABRE, CUPID and CUORE experiments.  
Reviewer for EPL, Physics Letters, JHEP, JINST, Journal of Physics, NIM-A.  
Evaluator for UK Particle Physics Grants Panel of the Science and Technology Facilities Council, Swiss National Foundation, EU MSCA Actions in FP6, FP7, Horizon2020.

Dichiarazione sostitutiva di certificazione da rendere al fine della verifica delle condizioni ostative stabilite dall'art. 35 bis (\*) del Decreto Legislativo 30 marzo 2001, n. 165 e successive modificazioni e integrazioni

**DICHIARAZIONE SOSTITUTIVA DI CERTIFICAZIONE**  
(ai sensi dell'art. 46 del D.P.R. 445/2000)

Il/La sottoscritto/a ..... **Marinangeli** ..... **Simona** .....  
nato/a a ..... **L'aquila** ..... **Aq** ..... **18/07/1985** .....  
(luogo) (cognome) (prov.) (nome) (data)

consapevole che, ai sensi dall'art. 76 del D.P.R. 28 dicembre 2000 n. 445 e s.m.i., 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, sotto la propria responsabilità

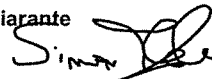
**d i c h i a r a**

di non aver riportato condanne penali, anche con sentenza non passata in giudicato, per i reati previsti dal Capo I del Titolo II del libro secondo del Codice Penale (delitti contro la pubblica amministrazione).

Il dichiarante si impegna a comunicare qualsiasi variazione dello stato dichiarato nell'arco temporale dell'incarico previsto.

..... **L'aquila** ..... **26/11/2018** .....  
(luogo) (data)

Il / La dichiarante



.....  
(firma per esteso e leggibile)

(\*)

Art. 35 bis

*(Prevenzione del fenomeno della corruzione nella formazione di commissioni e nelle assegnazioni agli uffici)*

1. Coloro che sono stati condannati, anche con sentenza non passata in giudicato, per i reati previsti nel capo I del titolo II del libro secondo del codice penale:
  - a) non possono fare parte, anche con compiti di segreteria, di commissioni per l'accesso o la selezione a pubblici impieghi;
  - b) non possono essere assegnati, anche con funzioni direttive, agli uffici preposti alla gestione delle risorse finanziarie, all'acquisizione di beni, servizi e forniture, nonché alla concessione o all'erogazione di sovvenzioni, contributi, sussidi, ausili finanziari o attribuzioni di vantaggi economici a soggetti pubblici e privati;
  - c) non possono fare parte delle commissioni per la scelta del contraente per l'affidamento di lavori, forniture e servizi, per la concessione o l'erogazione di sovvenzioni, contributi, sussidi, ausili finanziari, nonché per l'attribuzione di vantaggi economici di qualunque genere.
2. La disposizione prevista al comma 1 integra le leggi e regolamenti che disciplinano la formazione di commissioni e la nomina dei relativi segretari.