

## Andrea Bersani's Curriculum Vitae

- Name: Andrea Bersani
- Academic qualifications: Degree in Physics achieved at Genova University, September the 19<sup>th</sup>, 2001  
Ph.D. in Physics achieved at Genova University, April the 14<sup>th</sup>, 2005
- PostDoc positions: I had a grant, co-financed by EU and INFN, to work on target & magnet for the PANDA experiment. The grant started on July the 25<sup>th</sup>, 2005, and ended on July the 24<sup>th</sup>, 2007.  
I had a contract, financed by EU to work with INFN, to work on PANDA magnet system. The grant started on October the 10<sup>th</sup>, 2007, and ended on September the 30<sup>th</sup>, 2008.  
I had a temporary position as scientist at the University of Glasgow, to work on PANDA magnet system. The contract started on October the 1<sup>st</sup>, 2008 and ended on January the 31<sup>st</sup>, 2009.  
I had a temporary position with INFN, financed by EU, to work on PANDA and on FAIR. The contract started on February the 2<sup>nd</sup>, 2009, and ended on November the 1<sup>st</sup>, 2010.  
I had a grant with INFN to work on CUORE. The contract started on November the 2<sup>nd</sup>, 2010, and ended on October the 4<sup>th</sup>, 2012.  
I had a temporary position with INFN to work on computing. The contract started on October the 5<sup>th</sup>, 2012 and ended December the 31<sup>st</sup>, 2016.  
I have been a consultant for Fermi National Accelerator Laboratory, with a contract that started on February the 1<sup>st</sup>, 2017 and ended on April the 30<sup>th</sup>, 2017.  
I had a temporary position as technology scientist at INFN Sezione di Genova, started on May the 3<sup>rd</sup>, 2017, and ended on September the 30<sup>th</sup>, 2018.
- Present position: I presently have a permanent position as technology scientist at INFN Sezione di Genova, started on October the 1<sup>st</sup>, 2018 - complete address: via Dodecaneso 33, 16146 Genova, Italy - +390103536655
- Language abilities: Italian, comprehension C2, spoken C2, written C2  
English, comprehension C1, spoken C1, written C1  
French, comprehension B1, spoken A2, written A2  
German, comprehension A2, spoken A1, written A1
- Computer abilities: good knowledge of DOS/Windows and Mac OSX, deep knowledge of Unix/Linux

good knowledge of AutoCad, Ansoft Maxwell and ePhysics, Comsol Multiphysics, LabView, Root and other software used in engineering and physics  
good knowledge of C/C++, FORTRAN and PASCAL  
good knowledge of several digital imaging and web tool software (PhotoShop, Flash, DreamWeaver, GoLive...)  
Attended to a course on GPFS filesystem management  
Attended to a course on GRID infrastructure management  
Attended to a course on RedHat Enterprise Virtualisation  
Achieved RedHat Certified System Administrator certification in 2013

Scientific divulgation I collaborated to the Festival della Scienza in 2003 and 2004, working on INFN installations  
Since August 2013 I write for Scientificast, scientific blog and podcast: I wrote more than 100 posts and the blog is reached by 1000 people for 1600 pageviews per day  
Since 2015 to 2018 I have been vice president of Pint of Science Italia, an organisation in charge of organising a nationwide science festival, growing from 5 to 12 thousands of attendees in these years, since 2015 I coordinate the edition for the city of Genova  
Since end 2017 to end 2020 I have been the contact person for dissemination in INFN Sezione di Genova.

Additional information: Italian citizenship  
car driving licence  
horse riding licence

## Scientific Activities

### Degree Thesis Activity

As a degree thesis activity, I made the first target spin asymmetry measurement in exclusive electroproduction of  $\pi^+$  from a polarised protons target. The measurement was performed using the data of EG1 and EG2000 experiments, performed with the CLAS spectrometer at the Jefferson Laboratories (<http://www.jlab.org>). I also attended for a period to the data taking of EG2000 experiment, both taking some shift on the experiment and performing the raw data reconstruction for further analysis. During that period, I mainly developed my programming skills.

### Ph.D. Activity

My Ph.D. activity was devoted to NEMO (NEutrino Mediterranean Observatory, <http://nemoweb.lns.infn.it>) and ANTARES (Astronomy with a Neutrino Telescope and Abyss environmental RESearch, <http://antares.in2p3.fr>): in particular, I studied from various points of view the possibility to extend the sensitivity of the detector to the low energy part of cosmic neutrinos spectrum. To this extent, using a simulation code, I studied how the various configurations of the optical modules in the detector produce different detection efficiencies as a function of the neutrino energy. In the second part of my work I built one of these configurations using a set of oriented small photomultipliers (PMTs) housed inside a glass sphere and I built a test facility to measure its detection efficiency and angular acceptance for signals produced by atmospheric muons in water. From the simulation

it was clear that a large area PMT together with some indication on the direction of the Cherenkov photons from the muon tracks was the best choice to improve the response at low energy. In the last part of my job I developed the procedure to evaporate a bialkali photocathode in view of the design of a large effective area, multianodic PMT. During that period, I improved my knowledge on vacuum technology, slow controls and DAQ and, in addition, on my software capability.

### PostDoc Activity

For several years after my PhD I worked on the PANDA experiment (<http://www-panda.gsi.de>), working on two tasks. I studied the design of the detector solenoid, a thin superconducting coil with its iron flux return yoke, making many models and calculations with proper software (Ansoft Maxwell and AutoDesk AutoCad), producing a final design completely compatible with all the detectors' requirements. In addition, I worked on the internal gas jet target: in particular, I'm working on the new slow control system, based on modern PLC technology, for the target itself. In this period I strongly improved my knowledge in slow controls, I got a good experience in finite elements calculation and a good knowledge on superconductors and cryogenics.

My work has been recognised by the PANDA collaboration making me member of the Editorial Board of the TDR for the PANDA magnet system and for the PANDA target system. In addition, since the beginning of February 2009 to the end of 2011, I have been member of the FAIR Joint Core Team Research Coordination Group, a restricted coordination group in charge of supervising the experiments design and the overall progress of the laboratory development.

Since November 2010 I joined the CUORE collaboration. For this detector, I've been responsible for the vibration suppression in the cold mass suspension. This is essential to ensure the best energy resolution of the CUORE bolometers: the energy inlet, in any form, must be minimised to achieve this result. In these first months I did the first eigenfrequencies measurements on the mechanical structures on which the detector suspension is attached to find any mechanical short-circuit. In addition, I'm working on the integration of the thermal joints integration inside the detector cryostat.

Since October 2012 I work for the Computer Centre of INFN Genova Division, mainly on central UNIX/LINUX services. My work is mainly devoted to cloud computing, virtualisation and distributed storage, from the point of view of management and informatics infrastructure. I cooperate with my group in the maintenance and development of all the IT systems of our Computer Centre, ranging from network, to wi-fi, distributed storage, batch queues for massive computing, both based on the GRID infrastructure and on local basis, mail system, VPN, user support. A significant part of my time is also devoted to web services, implementing SVN, wiki pages, different CMSs, management interfaces for virtual machines: on this topics I give a significant contribution in the development of new functionalities for the users.

Since July 2015 I started collaborating with the superconducting magnet design group in Genova, in particular on the development and testing of parallelised code for magnetic field calculation and on the follow-up of the ongoing activities of the group. My main task, on this side, has been the final mechanical and thermal calculations on the Transport Solenoid coils for the Mu2e experiment at FermiLab. I also followed the construction of the model module and its shrink fitting, in close collaboration of the FermiLab group in charge of the TS procurement, at ASG Superconductors premises, which is the magnet supplier. This activity has proceeded til the mid of 2020: I have been in charge of witnessing all the activities at ASG Superconductors premises and analysing all the mechanical potential issues in the various coils that are produced.

### Present Activity

I am now working on two different projects for superconducting magnets. In the framework of High Luminosity LHC, with my group in Genova we are working on the recombination dipole MBRD, a double aperture, same polarity dipole in charge of making the trajectories of the beams intersect at the interaction point. Presently, the short model has been built and tested and the full scale prototype is complete and ready for tests at CERN. Afterwards, a 6-pieces series will be built. In this project I am responsible for the industrial follow-up and on the mechanical characterisation of the magnet. In parallel, since 2019, I started working on the design of a large solenoid magnet for the DUNE argon gas detector at the Near Detector, ND-GAr. This is a very large magnet, ~7m diameter, ~8m length warm bore, featuring a 0.5 T. The project is ongoing and I am now the contact person for INFN.

### Teaching Activity

In the Academic years 2002/2003 and 2003/2004, I was a tutor for the undergraduate students in Physics, at Università degli Studi di Genova . In the Academic year 2004/2005 I gave lectures on general physics exercises for the undergraduate students in Biology at Università degli Studi di Genova. Since Academic year 2005/2006 I'm in the exam commission of laboratory of general physics for the undergraduate students in Chemistry at Università degli Studi di Genova. During the Academic Year 2006/2007 I was in the exam commission of particle physics accelerators for the students in Physics at Università degli Studi di Genova. During the Academic Year 2019/2020 I was contract professor with Università degli Studi di Genova for the courses of General Physics for Informatics Engineering and Laboratory 1 for Physics, at Università degli Studi di Genova. This year I am contract professor for the course of Laboratory 1 for Physics, at Università degli Studi di Genova.

### Attended Conferences and Workshops

I attended, presenting a personal contribute, to the following conferences and workshops:

Very Large Volume Neutrino Telescopes 06, Amsterdam 2006  
Magnet Technology 20, Philadelphia 2007  
Ring Imaging Cherenkov Counters 2007, Trieste 2007  
Applied Superconductivity Conference 2008, Chicago 2008  
Very Large Volume Neutrino Telescopes 08, Tolone 2008  
European Conference on Applied Superconductivity 09, Dresda 2009  
Very large Volume Neutrino Telescopes 09, Atene 2009  
Nordic Conference in Nuclear Physics 2011, Stoccolma 2011 (invited talk)  
Particle and Nuclei International Conference 2011, Boston 2011  
Magnet Technology 22, Marsiglia 2011  
Applied Superconductivity Conference 2018, Seattle 2018  
Applied Superconductivity Conference 2020, online 2020  
Magnet Technology Conference 2021, Fukuoka and online, 2021

Genova, January the 24<sup>th</sup>, 2022

