EUROPEAN CURRICULUM VITAE FORMAT

PERSONAL INFORMATION

Name	**GIANFRANCO PATERNO'**
Current position	**Postdoctoral Research Fellow at INFN - Ferrara**

WORK EXPERIENCE

• Dates (from – to)	July 2016 – present
• Name and address of employer	INFN - Ferrara
• Occupation or position held	**Postdoctoral Research Fellow in Accelerator Physics**
• Main activities and responsibilities	Simulation of the experimental beamline of ELI-NP-GBS. Design, characterization and simulation of the Gamma Profile Imager for the ELI-NP gamma beam.
• Dates (from – to)	February 2017 – June 2017
• Name and address of employer	University of Ferrara – Department of Life Sciences and Biotechnology
• Occupation or position held	**Teaching Assistant of the course "Physics"** for Biotechnology students – 20 hours
• Dates (from – to)	April 2016 – June 2016
• Name and address of employer	University of Ferrara – Department of Chemical and Pharmaceutical Sciences
• Occupation or position held	**Teaching Assistant of the course "Physics II and Laboratory of physics"** for Chemistry students – 48 hours
• Dates (from – to)	December 2013 – May 2014
• Name and address of employer	University of Ferrara – Department of Physics and Earth Sciences
• Occupation or position held	**Tutor of the course "Physics I"** for Physics students – 21 hours
• Dates (from – to)	October 2013 – November 2013
• Name and address of employer	University of Ferrara – Department of Life Sciences and Biotechnology
• Occupation or position held	**Tutor of the course "Physics"** for Biology students – 25 hours
• Dates (from – to)	November 2007 – December 2012
• Occupation or position held	**Consulting Engineer**
• Main activities and responsibilities	Design of electric and thermal plants. Building structural analysis.
• Dates (from – to)	February 2006 – November 2006
• Occupation or position held	**Internship at STMicroelectronics (Catania)**
• Main activities and responsibilities	Design of integrated circuits in CMOS technology. Electromagnetic simulations and design of monolithic integrated inductors and transformers.

EDUCATION AND TRAINING

• Dates (from – to)	January 2013 – March 2016
• Name and type of organization providing education and training	University of Ferrara – Department of Physics and Earth Sciences
• Title of qualification awarded	**PhD in Physics**
• Principal subjects/occupational skills covered	- X-ray diffraction in crystals, - Crystal micromachining and characterization, - Medical application of X-ray optics, - Development of Monte Carlo simulation codes. *Attended courses:* - Quantum mechanics, Element of nuclear and sub-nuclear physics, - Solid state physics, Surface physics, - Medical physics, Radiobiology, - Vacuum technology. *Attended schools:* - V national school on "Detectors and Electronics for High-Energy Physics, Astrophysics, Space Applications, and Medical Physics" – LNL-INFN 15-19 April 2013. - "XI Seminar on Software for Nuclear, Subnuclear and Applied Physics" – Alghero 25-30 April 2014. *Periods abroad:* - Various experiments of hard X-ray diffraction from bent crystals at ILL and ESRF facilities (Grenoble, France) *Research projects:* - LOGOS e LAUPER (INFN). Main responsibility: data taking and analysis. Monte Carlo Simulations. *Thesis carried out under the supervision of prof. Vincenzo Guidi, title:* - Laue lenses to focus X- and gamma-ray beams for medical applications
• Level in national or international classification	ISCED 6

• Dates (from – to)	January 2013 – November 2013
• Name and type of organization providing education and training	University of Ferrara – Department of Physics and Earth Sciences
• Title of qualification awarded	**Scientific-Cultural Master's Degree (II Level) in Physics, 30/30**

• Dates (from – to)	July 2011 – October 2012
• Name and type of organization providing education and training	University of Catania – Department of Physics and Astronomy
• Title of qualification awarded	**II Level Master's Degree in Monitoring of Radiations**. Final mark 70/70 magna cum laude.
• Principal subjects/occupational skills covered	- Physics of radiations, - Source of radiations, - Dosimetry and radioprotection, - Radiation detectors, - Nuclear Medicine, - Particle accelerators, - Hadron therapy. *Internship and thesis* - **Internship for 8 months at INFN-LNS,** - Thesis: "Physical and radioprotection aspects of the CATANA project".

• Dates (from – to)	October 1999 – February 2007
• Name and type of organisation providing education and training	University of Catania – Department of Electric, Electronic and Computer Engineering
• Title of qualification awarded	**Master's Degree in Electronic Engineering**. Final mark 110/110 magna cum laude.
• Principal subjects/occupational	- Mathematics, Physics,

skills covered	- Signal theory, Communication systems, - EM Fields, Numerical methods for EM fields, - Informatics, Microprocessors, Control Theory, - Analog, Digital, Power and RF Electronics, - Semiconductor Device Physics, Sensors. *Internship and thesis* - Internship for 9 months at STMciroelectronics (Catania), - Thesis: "RF power amplifier in CMOS-SOI technology with reconfigurable matching".
• Level in national or international classification	ISCED 5
• Dates (from – to)	October 1994 – July 1999
• Name and type of organization providing education and training	Liceo Scientifico statale "E. Fermi" di Paternò (CT).
• Title of qualification awarded	**High school specialized in scientific subjects**. Final mark 100/100.
• Level in national or international classification	ISCED 3

PERSONAL SKILLS AND COMPETENCES

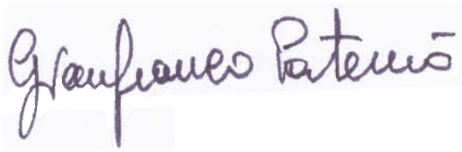
MOTHER TONGUE	**ITALIAN**
OTHER LANGUAGES	**ENGLISH**
• Reading skills	GOOD (CAMBRIDGE FCE – B2)
• Writing skills	GOOD (CAMBRIDGE FCE – B2)
• Verbal skills	GOOD (CAMBRIDGE FCE – B2)
OTHER LANGUAGES	**SPANISH**
• Reading skills	GOOD
• Writing skills	GOOD
• Verbal skills	GOOD
SOCIAL AND ORGANIZATIONAL SKILLS AND COMPETENCES	- Social skills acquired during my sport career (I played baseball at semi-pro level for 19 years). - High propensity for teamwork in national and international environment. - Ability to manage a workgroup acquired during my experience as a baseball coach (I was coach of a youth team for 3 years) and during my work as a consultant engineer. - Knowledge of basic techniques of Project Management. - Extremely organized person. - High problem solving attitude and fast learning speed. - End-oriented work capacity.
TECHNICAL SKILLS AND COMPETENCES	- Precision dicing machine (Disco DAD 3220™), - Optical profiling machine (Veeco Wyko NT1100™), - Diffractometer machine (Panalytical™ X'Pert PRO MPD XL™), - **Instrumentation of an electronics laboratory,** - **Programming of microcontrollers in C,** - Device for measuring EM fields and ionizing radiations, - Attitude for Computer Simulations and FEM analysis.
COMPUTER SKILLS AND COMPETENCES	- Operating systems: WINDOWS, LINUX. - Programming language: C/C++, Assembler, Java, Visual Basic (entry level). - Web technology (entry level): html, CSS, php, Javascript, MySQL. - Excellent knowledge of LATEX and OFFICE (advanced use of EXCEL). - CAD and software for Graphics: AUTOCAD, IMAGEJ, PHOTOSHOP. - Software for mathematics and data analysis: MATLAB, MATHEMATICA, ROOT, GNUPLOT.

- Particle tracking Monte Carlo software: GEANT4, GAMOS, FLUKA (entry level).
- **Software for Circuit Simulation: PSPICE, ADS (agilent).**
- Software for EM Simulation: MOMENTUM (agilent), ELFIN (unict).
- **Basic knowledge of VHDL and software for PCB and layout realization (Virtuoso).**
- General purpose FEM software: STRAUS7, SAP2000.
- Other software: SISMICAD, EDILUS,TERMUS, PRIMUS, CERTUS, TISYSTEM.

DRIVING LICENCE(S) A and B

ADDITIONAL INFORMATION
- SPORT: BASEBALL (SEMI-PRO LEVEL), TENNIS, SOCCER AND VOLLEYBALL (AMATORIAL LEVEL)
- HOBBIES: FISHKEEPING, FISHING, READING

Il sottoscritto acconsente, ai sensi del D.Lgs. 30/06/2003 n.196, al trattamento dei propri dati personali. Il sottoscritto acconsente alla pubblicazione del presente curriculum vitae sul sito dell'Università di Ferrara.



RESEARCH ACTIVITY

My **current** research activity is on Accelerator Physics. Indeed, I joined the EuroGammaS collaboration, which is responsible for the design, manufacturing, installation and commissioning of the ELI-NP-GBS, an intense and monochromatic gamma beam source based on inverse Compton interaction between an intense high power laser beam and a high brightness electron beam. My activity is within the WP9 group, which is in charge of developing the collimation and characterization system of ELI-NP-GBS. In particular, I am responsible for the development and maintenance of G4ELINP, the Geant4 code used for simulating the whole experimental beamline, from the interaction point to the detectors for the characterization of the beam. Through simulations using this code, I performed various studies to estimate and optimize the performance of the collimation and evaluate the signal to background ratio on the detectors. I am also involved in the design, characterization and optimization of the Gamma Profile Imager devoted to measure the spatial distribution of the ELI-NP gamma beam. My responsibility is to simulate the interaction of various beams with the scintillator crystal of the Imager and to estimate the expected signal using various configuration of the optical system.

I am also involved in the LAUPER project (INFN) devoted to develop a prototype of Laue lens capable of demonstrating the technological feasibility of a system producing a focused X-ray beam for cancer treatment. Indeed, by focusing the beam emitted by a polychromatic and divergent source (for example, an X-ray tube) toward a tumour target, it is possible to impart the maximum dose to the tumour and spare at the same time the healthy surrounding tissues. My responsibility is to design an optimized Laue lens and to simulate the dose deposition inside the patient's body.

My **past** research activity was focused on the realization of diffractive optical elements for hard X and soft gamma-rays and on crystal anisotropy, within the LOGOS project (INFN). I participated at several data taking, principally at ESRF and ILL, during which I developed skills of data analysis and online data analysis. Finally, I developed several codes for the simulation of high-energy photon diffraction in crystals, among which LAUENM, LAUETHER and CARL.

PRIZES

In March 2017, I received the "F. Resmini" prize given by INFN for the best PhD thesis in the field of "accelerator physics and new technologies" discussed in 2016.

LIST OF PUBLICATIONS

PEER-REVIEWED JOURNALS

- High-efficiency focusing of hard X-rays exploiting the quasi-mosaic effect in a bent germanium crystal - *Riccardo Camattari, **Gianfranco Paternò**, Alessandro Battelli, Valerio Bellucci, Pierre Bastie and Vincenzo Guidi* - J. Appl. Cryst. (2014) 47, 799-802.
- Quasi-mosaicity of (311) planes in silicon and its use in a Laue lens with high-focusing power - *Riccardo Camattari, **Gianfranco Paternò**, Valerio Bellucci and Vincenzo Guidi* - Experimental Astronomy (2014) 38, 417-431.
- High-efficiency diffraction and focusing of X-rays through asymmetric bent crystalline planes - *Valerio Bellucci, **Gianfranco Paternò**, Riccardo Camattari, Vincenzo Guidi, Michael Jentschel and Pierre Bastie* - J. Appl. Cryst. (2015) 48, 297-300.
- Design study of a Laue lens for nuclear medicine - ***Gianfranco Paternò**, Valerio Bellucci, Riccardo Camattari and Vincenzo Guidi* - J. Appl. Cryst. (2015) 48, 125-137.
- Manufacturing of Advanced Laue Optics for Gamma Observations (LOGOS) - *Andrea Mazzolari, Riccardo Camattari, Valerio Bellucci, **Gianfranco Paternò**, Carlo Scian, Giovanni Mattei, Vincenzo Guidi* – Nuclear Instruments and Methods in Physics Research B (2015) 355, 297-300.
- Ion implantation for manufacturing bent and periodically bent crystals - *Valerio Bellucci, Riccardo Camattari, Vincenzo Guidi, Andrea Mazzolari, **Gianfranco Paternò**, Giovanni Mattei, Carlo Scian and Luca Lanzoni* – Applied Physics Letter (2015) 107, 064102-064102-5
- Laue lens to focus an X-ray beam for radiation therapy - ***Gianfranco Paternò**, Michele Marziani, Riccardo Camattari, Valerio Bellucci, Andrea Mazzolari, Mauro Gambaccini and Vincenzo Guidi* - J. Appl. Cryst. (2016) 49, 468-478.
- Origin of quasi-mosaic effect for symmetric skew planes in a silicon or germanium plate – *Valerio Bellucci et al.* - J. Appl. Cryst. (2016). 49, 1810–1813.
- Homogeneous self-standing curved monocrystals, obtained using sandblasting, to be used as manipulators of hard X-rays and charged particle beams - *R. Camattari et al.* - J. Appl. Cryst. (2017). 50, 145–151.
- The Nuclear Resonance Scattering Calibration Technique for the EuroGammaS Gamma Characterisation System at ELI-NP-GBS - *M.G. Pellegriti et al.* - Journal of Instrumentation, Volume 12, March 2017.
- A collimation system for ELI-NP Gamma Beam System - design and simulation of performance - ***G. Paternò et al.*** - Nuclear Instruments and Methods in Physics Research, Section B, (2017).

CONFERENCES

- A collimation system for ELI-NP Gamma Beam System - design and simulation of performance - ***G. Paternò et al.*** - "Channeling 2016", Desenzano del Garda, 25 - 30 Settembre 2016.

POSTERS

- LAUe-PEak Radiotherapy (LAUPER) - A. Mazzolari et al. - "Channeling 2016", Desenzano del Garda, 25 - 30 Settembre 2016.