Luca Volpe CV

Personal address:
Calle Florida 2
37007 Salamanca
SPAIN

Professional address:
Centro de Láseres Pulsados (CLPU)
Edificio M5. Parque Científico. C/ Adaja, 8.
37185 Villamayor - Salamanca - SPAIN www.clpu.es

Mobile: +39 3402940744 +34 635682422

Born :09/10/1971 Milano (Italy)
Married, one children

STATUS:

- Director of the CLPU Laser-Plasma chair at the University of Salamanca (USAL)
- Responsible of the scientific research line at CLPU
- Responsible of the laser-plasma Diagnostic-development program at CLPU
- Member of the scientific Panel for User access at the VEGA system in CLPU

FIELD OF RESEARCH:

Extreme intensity, ultra short laser matter interaction, High energy physics, laser-driven particle and radiation sources, laser-plasma and laser-particle diagnostics, advanced HRR diagnostics, proton probing matter and plasmas, laser-plasma numerical methods (PIC, kinetic scheme and Monte Carlo codes). Laser-driven Shocks and highly compressed materials, fast ignition scheme to inertial confinement approach to fusion.

PRIZES

→"Francesco Resmini" National Prize by national Institute Of Nuclear physics (INFN) for the best Italian PhD Thesis of 2008 in accelerator physics

STUDENTS COORDINATION

During my Post-doc In Milano I was responsible of two Undergraduate students and one PhD student
From 2014 at the University of Salamanca (USAL) and Centro de Laseres Pulsados (CLPU)
I am the Director of thesis of 2 PhD students and Co-director of 2 PhD students. All the PhD students study in University of Salamanca and operate at the CLPU.
In 2015 I was also Co-relator of two PhD Stundents from University of Bordeaux.
All the above mentioned activities are on laser-Plasma physics.

CAREER & EDUCATION

→ (From October 2014) director of the CLPU chair at University of Salamanca and responsible for the CLPU Experimental campaign and relation with the Users.
→ (January 2014 October 2014) Senior scientist in the "plasma physics" group at the ELI-HU Nonprofit Kft. Szeged Hungary
→ (Jannuary 2013 → December 2013) Researcher (post doc) at the Centre Lasers Intenses et Applications (CELIA) Université Bordeaux 1
→ (Jannuary 2009 → December 2012) Researcher (post doc) at the University of Milan Bicocca (Rectoral research grant).
→ (June 2008 – December 2008) : short research grant at the University of Milano Bicocca under the supervision of Prof. D. Batani "Simulations of electron acceleration for the PLASMONX project by INFN"
→ (January 2008 – June 2008): high school teacher in Mathematics and Physics (Liceo Artistico Statale di Brera Milano).
→ (November 2004 - January 2008): Ph.D. student in Physics at University of Milano. Thesis on "3D Quantum Theory of Free Electron Lasers". Supervisor Dr. N. Piovella.
→ (July 2004): Degree in Physics at University of Milano Bicocca (108/110) Thesis on "Non planar correction to n-gluons distribution" Supervisor: Prof. G. Marchesini"

PUBLICATIONS
Author of about 60 publications 290 citations and h index 10
→ 35 **scientific papers** published on refereed journals:
Physical Review Letters and PRA, Plasma Physics and Cont. Fusion, Physics of Plasmas., Nuclear Instr. And Method A, Laser Physics, Optics Comm.
→ 25 papers in books of conference proceedings (AIP, SPIE, NIMA etc) (All with peer review).

ACADEMIC WORKS, ASSOCIATIONS AND PROJECTS
In doing my research I collaborate with many institutions and I was (and I am) involved in many international projects: member=fully involved, partner= more advisor.

→ 2016/2020 partner with CLPU and USAL in "Lab in a Bubble" Marie Curie Initial Training Network
→ 2016/2017 member with CLPU and USAL in LASERLAB-EUROPE 4 The integrated initiative of European laser research infrastructures.
→ 2014/2015 member with CLPU and USAL in LASERLAB-EUROPE 3 The integrated initiative of European laser research infrastructures.
→ 2014 Worker for the Extreme light infrastructure (ELI) Atto-second Light Pulse Source (ALPS) Project
→ 2010/2013 member with University of Milano-Bicocca in Hiper Project which is a proposed European High Power laser Energy Research facility dedicated to demonstrating the feasibility of laser driven fusion as a future energy.
→ member with University of Milano-Bicocca "LIFELONG LEARNING PROGRAMME" which is a EU grant agreement for an action with multiple beneficiaries (EU ERASMUS school).
→ member with University of Milano-Bicocca Erasmus IP proposal "An Introduction to high power light-matter interactions – HiPOLIN" from 2012 till 2015
→ member with University of Milano (PLASMONX project through the INFN) Italian project to obtain plasma monochromatic X-ray source
→ member with University of Milano (LILIA project through the INFN) Italian project to generate laser-driven proton beam
→ (March 2012) member to the panel review of grant proposals submitted to the U.S. Department of Energy's Joint Program in High Energy Density Laboratory Plasmas (HEDLP) sponsored by the Fusion Energy Sciences (FES) program of the Office of Science and the Office of Stockpile Stewardship of the Defense Programs of the National Nuclear Security Administration.
→ (August 2012) member to the Physics Evaluation Panel – 2012 for the Portuguese Foundation for Science and Technology (FCT)
→ I am referee for the following journals: i) AIP Review of Scientific Instruments Since 2009; ii) "Surface and Coatings Technology" since 2010 iii) Modern instrumentation, iv) Journal of Applied Physics.

3) Presentation in international conferences

Legenda
I=Invited Talk,
O=Oral presentation
P=Poster Presentation
V= visitor

→ (February 2016) 22-25 February 2016 CHILI conference, Tel-Aviv, Israel "Intense and fast laser-matter interaction at CLPU" (O)
→ (October 2015) 7-10 October 2015, PPLA conference, Frascati Rome Itlay "High. Rep. Rate Laser-driven particles at CLPU" (O)
→ (April 2015) 20-22 April 2015, 2th Laser targetry Plasma Workshop, Paris "targetry for the VEGA system at

CLPU" (I)

→ (June 2014) 23-27 June 2014, 41st EPS conference, Berlin "Controlling the fast electron divergence in a solid target with multiple laser pulses" (P)

→ (September 2013) 26-27 September 2013, Laserlab UserMetting, Marseille, France "Absolute reflectivity measurement of spherically bent crystals " (O)

→ (September 2013) 09-14 September 2013, FISMAT Politecnico di Milano, " *Fast electron transport in matter*" (O)

→ (May 2013) GSI workshop "Proton Radiography of High density Matter " May 28, 2013. (I)

→ (May 2013) 11th Direct Drive and Fast Ignition Workshop Rome, Italy May 6 - 8, 2013 "Parametric study of Fast electron beam guiding using two-consecutive laser pulses scheme " (O)

→ (August 2012) 26th SPIG "Preliminary results from recent experiments and future roadmap to Shock Ignition of Fusion Targets"

→ (July 2012) EPS/ICPP Stockholm, Sweden, 2-6 July 2012 "A simple model for propagation of fast electron in matter taking into account refluxing and electric stopping power" (P)

→ (June 2012) 11th Kudowa Summer school 2012 "Collisional and collective effects on fast electron propagation in matter" "(O)

→ (April 2012) Omega workshop (P) "Can proton radiography be used to image imploding target in ICF experiments ?"

→ (February 2012) Laserlab user meeting 16-17th February 2012 University of Szeged "Fast electrons transport in cylindrical compressed target" (I)

→ (February 2012) 4th Hiper Partecipants forum 3th February 2012 Bordeaux Hotel de Region (P)

→ (December 2011) Hiper Petal meeting 8th December Bordeaux Hotel de Region (V)

→ (November 2011) 6thMeeting of the PHELIX and plasma physics program advisory committee Meeting November 17/18 2011. "K-alpha radiography of isochorically heated thin metal wire targets at PHELIX" Experiment proposal (I).

→ (September 2011) 5th Workshop "PPLA" September 21st-23rd 2011 Catania, Italy **"**Laser-driven Proton Imaging for Inertial Confinement Fusion (O)

→ (September 2011) PLASMA 2011 International Conference on Research and Applications of Plasmas Warsaw Poland September 12-16, 2011. "Can laser-driven protons be used as diagnostic in ICF experiments ?" (O)

→ (July 2011) 49th International school of Quantum electronics Ettore Majorana center Erice Sicily. L. Volpe "Proton radiography resolution in ICF experiments" (P)

→ (July 2011) 49th International school of Quantum electronics Ettore Majorana center Erice Sicily. L. Volpe "Experimental results on fast electron propagation in solid matter " (P)

→ (June-July 2011) 38th EPS Plasmas Strasburg 2011. L. Volpe "Laser-driven electron beam in matter" (P)

→ (May 2011) 4th EMMI workshop on Plasma Physics with Intense Heavy Ion and Laser Beams, GSI Darmstadt . L. Volpe "Can laser-driven protons be used as diagnostic in ICF experiments ?" (O)

→ (April 2011) HiPER Workshop in Prague: EOO2011**.** L. Volpe "Can proton radiography be used to image imploding target in ICF experiments ?" (P)

→ (December 2010) 2th International conference on Laser technology. Khartoum (Sudan). L. Volpe. "Proton Radiography Diagnostic using laser-based proton source in inertial confinement fusion" (I)

→ (November 2010) SOLS conference D. Batani , L. Volpe et al,Proton Radiography and Fast electron propagation trough Cylindrically Compressed target" 2010 (P)

→ (October 2010) 4th International conference on super strong field in plasmas Villa Monastero, Varenna, Italy. L. Volpe "Proton radiography of cylindrical laser-driven implosion" (O)

→ (October 2010) 4th International conference on super strong field in plasmas Villa Monastero, Varenna, Italy. L. Volpe "Proton radiography in Plasma" (P)

→ (September 2010) 4th Mathematica user group meeting L. Volpe "Seminar on symbolic computation to solve physical problems with Mathematica" (I)

→ (June 2009) 50th birthday of Laser invention University of Milano-Bicocca. L. Volpe "Monte Carlo methods in plasma physics" (I)

→ (January 2010) Hiper Workshop ,Paris L. Volpe "Proton radiography: Monte Carlo simulations" (I)

(September 2009) Hiper Workshop, Abingdon L. Volpe "--" (I)

4) Partecipation to Experiments (direct participation or theoretical support)

Legenda
PI, co-Pi,
Participant=responsible of one or more diagnostics,
Design=participation to the design and analysis but no at the experiment

→ (November-Dicemeber 2016) LULI laboratory, Paris, France
"Time controlled fast electron collimation" (Pi)
→ (February 2016) GSI
"Laser-driven Intense Magnetic fields generation " (Participant)
→ (April 2015) CLPU
"Time and spatial-resolved measurements of plasma-structure in the laser produced plasma" (Co-Pi)
→ (October 2013) PALS
"Femtosecond interferometric investigation of initial stages of the shock ignition relevant plasmas generated by laser irradiation of planar targets" (Participant)
→ (August 2013) MBI Berlin (LaserLab)
" production of neutral atoms by injecting energetic protons in a helium gas jet. (Design)
→ (June 2013) GSI Darmstad (Laserlab)
"Development of X-ray monochromatic radiography diagnostics at PHELIX facility for WDM experiments" (Design)
→ (May 2013) Laboratoire pour l'Utilisation des Lasers Intenses Ecole Polytecnique, Paris (LASERLAB)
"Study of cone target perturbation by shock and related fast electron generation and transport in warm dense matter" (LASERLAB) (Participant)
→ (December 2012) Univ. Bordeaux, CNRS, CEA, CELIA (laserLab) Talence, France
"Absolute reflectivity measurement of spherically bent crystals" (PI)
→ (November-December 2011+July 2012) LULI, Paris
"Study of cone target perturbation by shock and related fast electron generation and transport in warm dense matter." (Participant)
→ (April 2011) Institute of Physics, Chinese Academy of Sciences, Beijing, China
"K alpha measurements of spatial and spectral properties of laser produced fast electrons" (PI)
→ (November 2010) Tata institute of fundamental research Colaba, Mumbai
"measurements of K alpha x-ray emission and magnetic field measurements from plasmas induced in different targets " (Co-Pi)
→ (March April 2009) LULI, Paris (LaserLab)
"Fast electron transport in 1D counter-propagative shock compressed targets" (Participant)
→ (December 2008) Rutherford Appleton Laboratory (RAL) Harwell Science and Innovation Campus Didcot OX11 0QX "Fast electrons propagation in cylindrical compressed target"

5) Teaching experience
(TEI of Crete March 2016) Laser-Driven proton probing and imaging matter (Intense course 16 hours)
(CLPU May 2015) Lasers-driven plasmas and radiation at PW level (Intense course 10 hours)
(Academic years 2013/14) Intensive course of Monte Carlo methods for particles transport at the Physics Department of the University of Milano
(Academic years 2013/14) Assistant for laboratory of Physics at University of Milano prof. F. Camera
(Academic years 2012/13) Assistant for the Course of general Physics at Department of Mathematics Prof. G. Gambarini
(Academic years 2012/13) Assistant for laboratory of Physics at University of Milano prof. F. Camera

(Academic years 2011/12) Assistant for laboratory of Physics at University of Milano prof. F. Camera
(Academic years 2010/11, 2011/12) Intensive course Introduction to Monte Carlo methods for particles transport at the Physics Department of the University of Milano Bicocca
(Academic years 2008/09, 2009/10) Intensive course of Monte Carlo methods for particles transport at the Physics Department of the University of Milano
(Academic years 2008/09, 2009/10, 2010/11) Assistant for the Course of Optics at the Physics Department of the University of Milano- Bicocca Prof. D. Batani
(Academic years 2007/08) Assistant for the course of Physics at the Biology Department of University of Milan Prof. A. Vailati
(Academic year 2006/07) Assistant for the course of Physics at the Biology Department of University of Milan Prof. N Piovella
(Academic year 2005/06) Assistant for the course of Analysis method for physics and engineering at Polytechnic of Milano Prof. M. Biroli
(Academic year 2005/06) Physics and Mathematics teacher in High school "Europa", Milano
(Academic years 2003/04, 2004/05) Physics and Mathematics teacher in High school "Europa", Milano

6) Computer Knowledge

I have an extensive knowledge of computational methods for particle beam generation (Particle In Cell codes) and transport (kinetic and Monte Carlo codes) and for laser-driven plasma dynamics (hydrodynamic codes) among which I) MCNPX and FLUKA from LANL and CERN, II) MULTI and CHIC from Polytechnic in Madrid and CELIA in Bordeaux, iii) Ephoc and picls from UK and CELIA Bordeaux. I have also wrote many intermediate codes prevalently in Fortran. I am also expert in using the “Mathematica” and with respect to this I have a related publications. I use prevalently Linux Operative system.
Applications: Latex, emacs, Matlab, Mathematica, Maple.
Programming languages: Fortran 90, C, C++, html, Open MP, MPI, SMS

10 selected publications

n°	Enhanced Relativistic-Electron-Beam Energy Loss in Warm Dense Aluminum Best 10 publications
10	X Vaisseau, A Debayle, JJ Honrubia, S Hulin, A Morace, Ph Nicolaï, H Sawada, B Vauzour, D Batani, FN Beg, JR Davies, R Fedosejevs, RJ Gray, GE Kemp, S Kerr, K Li, A Link, P McKenna, HS McLean, M Mo, PK Patel, J Park, J Peebles, YJ Rhee, A Sorokovikova, VT Tikhonchuk, L Volpe, M Wei, JJ Santos *Enhanced Relativistic-Electron Beam energy Los in Warm dense Aluminium* Physical review letters 114 (9), 095004
9	L Volpe, JL Feugeas, Ph Nicolai, JJ Santos, M Touati, J Breil, D Batani, V Tikhonchuk *Controlling the fast electron divergence in a solid target with multiple laser pulses* Physical Review E 90 (6), 063108
8	**L. Volpe**, D. Batani, G. Birindelli,, A. Morace, P. Carpegiani, M. H. Xu, F. Liu, Y. Zhang, Z. Zhang, X. X. Lin, F. Liu, S. J. Wang, P. F. Zhu, L. M. Meng, Z. H. Wang, Y. T. Li, Z. M. Sheng, Z. Y. Wei, J. Zhang, J.J. Santos, C. Spindloe "*Laser-driven Electron beam in matetr*" Phys. Plasmas **20**, 033105 (2013);
7	**L. Volpe,** D. Batani, A. Morace, J.J. Santos. "*Collisional and collective effects in 2D model for fast-electron transport in refluxing regimes*" Phys. Plasmas 20, 013104 (2013)
6	B. Vauzour, J. J. Santos, A. Debayle, .. **L. Volpe**, et al. *"Relativistic high-current-electron-beam stopping-power characterization in solids and plasmas: Collisional versus resistive effects"* Phys. Rev. Let. 109 255002 (2012) 2012
5	F. Pérez, A. Debayle, J. Honrubia, M. Koenig, D. Batani, S. D. Baton, F. N. Beg, C. Benedetti, E. Brambrink, S. Chawla, F. Dorchies, C. Fourment, M. Galimberti, L. A. Gizzi, L. Gremillet, R. Heathcote, D. P. Higginson, S. Hulin, R. Jafer, P. Koester,9 L. Labate, K. L. Lancaster, A. J. MacKinnon, A. G. MacPhee, W. Nazarov, P. Nicolai, J. Pasley, R. Ramis, M. Richetta, J. J. Santos, A. Sgattoni, C. Spindloe, B. Vauzour, T. Vinci, and L. Volpe "*Magnetically-guided fast electrons in cylindrically-compressed matter"* Phys. Rev. Lett. **107**, 065004 (2011)
4	**L. Volpe**, D. Batani, B. Vauzour, Ph. Nicolai, J.J. Santos, C. Regan, A. Morace, F. Dorchies, C. Fourment, S. Hulin, Perez, S. Baton, K. Lancaster, M. Galimberti, R. Heathcote, M.Tolley, Ch.Spindloe, P. Koester, L. Labate, L.A. Gizzi, C. Benedetti, A. Sgattoni, M. Richetta, J. Pasley, F. Beg, S. Chawla, D.P. Higginson, A.G. MacPhee *"Proton radiography of laser-driven imploding target in cylindrical geometry"* Phys. Plasmas 18, 006101 (2011)
3	**L. Volpe** "*3D Quantum Theory of Free Electron Lasers*" (tesi di dottorato) pubblicata il 30 June 2010 editore: LAP Lambert Academic Publishing AG & Co KG ISDN:9783838319667
2	N. Piovella, M. M. Cola, **L. Volpe**, A. Schiavi and R. Bonifacio "*Three-Dimensional Wigner-Function Description of the Quantum Free-Electron Laser"* Phys. Rev. Lett. 100, 044801 (2008)
1	R. Bonifacio, N. Piovella, M. M. Cola and **L. Volpe** *"Experimental requirements for X-ray compact free electron lasers with a laser wiggler"* Nucl. Instrum. and Meth. in Phys. Res. A 577, 745 (2007).