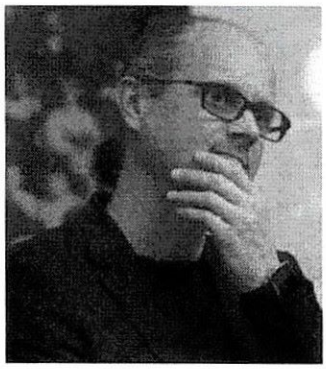
PERSONAL INFORMATION



Leonida Antonio GIZZI

[redacted]

CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO NAZIONALE DI OTTICA (CNR-INO)
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WORK EXPERIENCE

- **Research Director** (Dirigente di Ricerca) at Istituto di Ottica (INO) - CNR, Pisa (current)
- **Head** of the Pisa Unit of Istituto Nazionale di Ottica (http://www.pi.ino.cnr.it/pisa/) (current)
- **Director** of the Intense Laser Irradiation Laboratory (current)
- Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche http://www.cnr.it. http://www.pi.ino.cnr.it
- Business or sector: PUBLICH RESEARCH

ONGOING RESEARCH PROJECT WITH LEADING ROLE

> Next Generation EU (PNRR) - Tuscany Health Ecosystem (THE) 2022-2025 – CNR Delegate and Principal Investigator of Spoke 1 – "Advanced radiotherapies and diagnostics in oncology"
> Next Generation EU (PNRR) - IPHOQS - INTEGRATED INFRASTRUCTURE INITIATIVE IN PHOTONIC AND QUANTUM SCIENCES, WP Leader
> EU H2020 - Innovation Fostering in Accelerator Science and Technology (I.FAST) 2020-2024, Task Leader on Laser Driver Development for Plasma Accelerators
> EU H2020 - Compact European Plasma Accelerator with Superior Beam Quality (EuPRAXIA) 2022-2026, PP of Research Infrastructure, WP Leader (Laser Development):
> IT MoD - "APOLLO (Advanced Pulsed Orientable Laser for Long distance Operations) – 2019-2024, High repetition rate Ultrafast Laser development

SAMPLE of PAST PROJECTS WITH LEADING ROLE

> IT MUR-CNR - Implementazione di Progetti della Roadmap Europea ESFRI: "Extreme Light Infrastructure" (ELI), 2013-2019, PI of Research Unit at CNR-INO
> EU FP7 - High Power laser Energy Reseach Facility (HiPER), Research Infrasturcures, 2008-2011, PI of IPCF- CNR research unit
> INFN Commissione Nazionale V, Progetto FAST - Femtosecond timing and sync, 2007-2009, PI of Pisa Research Unit – INFN Sez. Pisa
> MIUR-FISR- national project on *Compact Ultrafast X-ray Sources*, National Coordinator, 2003-2007
> EU FP5 European training network XPOSE, *X-ray probing of the structural evolution of matter*, Head of IPCF-CNR node, 2000-2004
> ASI Italian Space Agency. Laue-diffraction optics for gamma-ray astronomy, Scientist in charge of Pisa research unit, 2000-2001

SAMPLE OF OTHER RESEARCH PROJECTS WITH PARTICIPANT ROLE

> EC European training network GAUS-XRP II, Generation and application of ultrashort, laser-produced X- ray pulses, 1996-200;
> EC European training network SILASI, Superintense Laser Solid Interactions, 1996-2000;
> EC European training network GAUS-XRP I, Generation and application of ultrashort, laser-produced X- ray pulses, 1993-1995;
> CNR institutional projects on *High power density laser-matter interactions*, 1989-1996.

CONFERENCES AND WORKSHOPS

More than 70 oral and invited presentations at international conferences and workshops.

PUBLICATIONS

Author of 315 publications (Source ISI Web of Science) including more than 220 articles on **refereed** (JCR) journals (as of May 2024) with more than 6000 citations. H-Index: 45 (G. Scholar) H-Index: 35 (ISI WOS)

EDUCATION AND TRAINING

PhD: (1990-2004) 1994: Ph.D. in Plasma Physics and D.I.C (Imperial College of Science technology and Medicine, University of London;
Laurea: (1983-1989) Laurea in Fisica, Università degli studi di Pisa, Laurea in Fisica (Università di Pisa);
OTHER POSITIONS, SCHOLARSHIPS AND AWARDS: EU Marie Curie Fellowship at Imperial College, London, UK, 1995 • Scholarship of the Italian Space Agency at IFAM-CNR, Pisa, 1994 • Scholarship of the National Research Council at l'Imperial College di London, UK, 1993-94 • Research Associate at Imperial College, London, UK, 1993 • Scholarship of the National Research Council at IFAM-CNR, Pisa, 1991-92 • Scholarship of the National Research Council at Imperial College di London, UK, 1991.
MAIN RESEARCH FIELDS: Radiation Sources • High Power Laser Interaction with Matter •X-Ray Emission From Laser Produced Plasmas – X and Gamma Ray Generation and Applications • High Energy Astrophysics.
RESEARCH INTERESTS: Ultra Short, Ultraintense Laser Plasma Interactions • E.m. wave propagation • Atomic physics of ionised species • Collective phenomena and instabilities • Inertial confinement fusion related studies • X-ray generation and characterisation • Particle acceleration in laser-matter interactions • X- ray and gamma ray optics • Plasma acceleration of particles • Dosimetry • Radiobiology.
Master and PhD supervision: more than 20 Master and PhD Theses Supervision

REVIEWER ROLE

CAMBRIDGE JOURNALS Member of the Editorial Board of "High Power Laser Science and Engineering"

APS since 1997 *Referee* of *Phys. Rev. Lett., Phys Rev. E*

APS since 2008 *Outstanding Referee of the American Physical Society (APS).*

nature since 2010, *Referee of Nature, Nature Communications, Nature Physics, Scientific Reports.*
Other referee roles: *Physics of Plasmas, Laser and Particle Beam,* New J. Physics ed altre

Curriculum Vitæ

Informazioni personali

Nome
Indirizzo
Telefono
E-mail
Cittadinanza
Data di nascita

Titoli di studio

Data di conseguimento	18/03/2011
Titolo conseguito	Dottore di ricerca
Descrizione	Università
Titolo della Tesi	Influenza degli ultrasuoni nello scambio termico in monofase e bifase
Titolo dottorato	ENERGETICA ELETTRICA E TERMICA
Nome e indirizzo istituzione	Università di PISA - Lungarno Pacinotti, 43/44 - PISA

Data di conseguimento	03/05/2007
Titolo conseguito	Laurea specialistica/magistrale
Voto conseguito	105
Classe di laurea	33/S Classe delle lauree specialistiche in ingegneria energetica e nucleare
Nome e indirizzo istituzione	Università di PISA - Lungarno Pacinotti, 43/44 - PISA

Data di conseguimento	01/03/2004
Titolo conseguito	Laurea triennale
Descrizione	Ingegneria Meccanica
Voto conseguito	101/110
Titolo della Tesi	Studio della convezione in una lastra piana verticale in presenza di getti destabilizzanti
Classe di laurea	10 Classe delle lauree in ingegneria industriale
Nome e indirizzo istituzione	Università di PISA - Lungarno Pacinotti, 43/44 - PISA

Esperienze

Periodo	01/02/2022 - oggi
Posizione	Ricercatore presso Ente di ricerca
Qualifica	Ricercatore
Tipo di attività svolta	ricercatore III livello prima fascia
Nome e indirizzo	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma

istituzione	
Struttura	Istituto Nazionale di Ottica
Periodo	20/07/2020 - 31/01/2022
Posizione	Tecnologo a tempo determinato
Qualifica	Tecnologo a tempo det.
Tipo di attività svolta	tecnologo a tempo determinato III livello II fascia
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	20/07/2019 - 19/07/2020
Posizione	Tecnologo a tempo determinato
Qualifica	Tecnologo a tempo det.
Tipo di attività svolta	gestione e manutenzione sale sperimentali, progettazione di apparati di diagnostica di processi di accelerazione laser-plasma, partecipazione a progetti di divulgazione scientifica
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	20/07/2018 - 19/07/2019
Posizione	Tecnologo a tempo determinato
Qualifica	Tecnologo a tempo det.
Tipo di attività svolta	gestione e manutenzione sale sperimentali, progettazione di apparati di diagnostica di processi di accelerazione laser-plasma, partecipazione a progetti di divulgazione scientifica
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	01/06/2016 - 31/05/2018
Posizione	Assegnista di ricerca
Tipo di attività svolta	Accelerazione laser-plasma di ellettroni ed interazione laser-materia ad altissime intensità
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	01/12/2014 - 31/05/2016
Posizione	Assegnista di ricerca
Tipo di attività svolta	accelerazione di elettroni indotta da laser di potenza per applicazioni radioterapiche e ai materiali
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	01/12/2013 - 30/11/2014
Posizione	Assegnista di ricerca
Tipo di attività svolta	accelerazione di elettroni indotta da laser di potenza per applicazioni

	radioterapiche
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	01/12/2012 - 30/11/2013
Posizione	Assegnista di ricerca
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	01/12/2011 - 30/11/2012
Posizione	Assegnista di ricerca
Tipo di attività svolta	Consiglio Nazionale delle Ricerche
Nome e indirizzo istituzione	Consiglio Nazionale delle Ricerche - Piazzale Aldo Moro, 7 - Roma
Struttura	Istituto Nazionale di Ottica
Periodo	01/06/2011 - 18/11/2011
Posizione	Assegnista di ricerca
Nome e indirizzo istituzione	Università degli Studi di MODENA e REGGIO EMILIA - Via Universita', 4 - MODENA
Periodo	01/01/2008 - 31/12/2010
Posizione	Attività didattica
Qualifica	Dottorando
Tipo di attività svolta	Supporto alla didattica nell'A.A. 2007/2008 e 2008/2009 per gli insegnamenti di Fisica Tecnica (Ingegneria Elettronica), Fisica Tecnica Ambientale (Ingegneria Civile, dell'Ambiente e del Territorio) e Fondamenti di Energetica (Ingegneria Meccanica)
Nome e indirizzo istituzione	Università di PISA - Lungarno Pacinotti, 43/44 - PISA
Struttura	Dip. ENERGETICA
Periodo	01/01/2008 - 31/12/2010
Posizione	Dottorando
Nome e indirizzo istituzione	Università di PISA - Lungarno Pacinotti, 43/44 - PISA
Struttura	Dip. SISTEMI ELETTRICI E AUTOMAZIONE
Titolo dottorato	ENERGETICA ELETTRICA E TERMICA

Elenco dei prodotti della ricerca

BAFFIGI, Federica, DUMAS, Antonio, GIULIANI, Ilaria, MADONIA, MAURO, TRANCOSSI, MICHELE (in stampa). A nozzle capable of deviating a Synthetic Jet in a dynamic and controllable manner with no moving mechanical parts and control

system thereof. PTC/IB2012-053198, UNIVERSITA' DEGLI STUDI DI MODENA E REGGIO EMILIA

A. Fioretti, Baffigi F, A. Macchi, O. Morsch, E. Tognoni, P. Andronico (2021). Let's play with Quantum Cryptography. A project for high school students during the pandemic. IL NUOVO SAGGIATORE, vol. 37, ISSN: 0393-4578

F. Brandi, L. Labate, D. Palla, S. Kumar, L. Fulgentini, P. Koester, Baffigi F, M. Chiari, D. Panetta, L.A. Gizzi (2021). A Few MeV Laser-Plasma Accelerated Proton Beam in Air Collimated Using Compact Permanent Quadrupole Magnets. APPLIED SCIENCES, vol. 11, ISSN: 2076-3417

L.A. Gizzi, E. Boella, L. Labate, Baffigi F, P.J. Bilbao, F. Brandi, G. Cristoforetti, A. Fazzi, L. Fulgentini, D. Giove, P. Koester, D. Palla, P. Tomassini (2021). Enhanced laser-driven proton acceleration via improved fast electron heating in a controlled pre-plasma. SCIENTIFIC REPORT, vol. 11, ISSN: 1479-0378

L.A. Gizzi, L. Labate, Baffigi F, F. Brandi, G. Bussolino, L. Fulgentini, P. Köster, and D. Palla (2021). Overview and specifications of laser and target areas at the Intense Laser Irradiation Laboratory. HIGH POWER LASER SCIENCE AND ENGINEERING (PRINT), vol. 9, ISSN: 2095-4719

P. Koester, Baffigi F, G. Cristoforetti, L. Labate, L. A. Gizzi, S. Baton, M. Koenig, A. Colaïtis, D. Batani, A. Casner, D. Raffestin, A. Tentori, J. Trela, C. Rousseaux, G. Boutoux, S. Brygoo, L. Jacquet, C. Reverdin, E. Le Bel, L. Le-Deroff, W. Theobald, and K. Shigemori (2021). Bremsstrahlung cannon design for shock ignition relevant regime. REVIEW OF SCIENTIFIC INSTRUMENTS, vol. 92, ISSN: 0034-6748

G. Cristoforetti, Baffigi F, F. Brandi, G. D'Arrigo, A. Fazzi, L. Fulgentini, D. Giove, P. Koester, L. Labate, G. Maero, D. Palla, M Romé, R. Russo, D. Terzani, P. Tomassini and L.A. Gizzi (2020). Laser-driven proton acceleration via excitation of surface plasmon polaritons into TiO2 nanotube array targets. PLASMA PHYSICS AND CONTROLLED FUSION, vol. 2, ISSN: 1361-6587

L. A. Gizzi, G. Cristoforetti, Baffigi F, F. Brandi, G. D'Arrigo, A. Fazzi, L. Fulgentini, D. Giove, P. Koester, L. Labate, G. Maero, D. Palla, M. Romé, M. Russo, D. Terzani, and P. Tomassini (2020). Physical Review research. PHYSICAL REVIEW RESEARCH, vol. 2, ISSN: 2643-1564

L. Labate, D. Palla, D. Panetta, F. Avella, Baffigi F, F. Brandi, F. Di Martino, L. Fulgentini, A. Giulietti, P. Koester, D. Terzani, P. Tomassini, C. Traino, L.A. Gizzi (2020). Toward an efective use of laser-driven very high energy electrons for radiotherapy: Feasibility assessment of multi-feld and intensity modulation irradiation schemes. SCIENTIFIC REPORT, vol. 2, ISSN: 1479-0378

Labate Luca, Palla Daniele, Panetta Daniele, Avella Federico, Baffigi Federica, Brandi Fernando, Di Martino Fabio, Fulgentini Lorenzo, Giulietti Antonio, Koester Petra, Terzani Davide, Tomassini Paolo, Traino Claudio, Gizzi Leonida A (2020). Toward an effective use of laser-driven very high energy electrons for radiotherapy: Feasibility assessment of multi-field and intensity modulation irradiation schemes. SCIENTIFIC REPORTS, vol. 10, p. 17307-1-17307-11, ISSN: 2045-2322, doi: 10.1038/s41598-020-74256-w

P. Tomassini, D. Terzani, Baffigi F, F. Brandi, L. Fulgentini, P. Koester, L. Labate, D. Palla and L. A. Gizzi (2020). High-quality 5 GeV electron bunches with resonant multi-pulse ionization injection". PLASMA PHYSICS AND CONTROLLED FUSION, vol. 62, ISSN: 1361-6587

T. Pisarczyk, M. Kalal, S. Yu. Gus'kov, D. Batani, O. Renner, J. Santos, R. Dudzak, A. Zaras-Szydlowska, T. Chodukowski, Z. Rusiniak, J. Dostal, J. Krasa, M. Krupka, Iu. Kochetkov, S. Singh, J. Cikhardt, T. Burian, M. Krus, M. Pfeifer, G. Cristoforetti, L.A. Gizzi, Baffigi F, L. Antonelli, N. N. Demchenko, M. Rosinski, D. Terwinska, S. Borodziuk, P. Kubes, M. Ehret, L. Juha, et al. (2020). Hot electron retention in laser plasma created under terawatt subnanosecond irradiation of Cu targets. PLASMA PHYSICS AND CONTROLLED FUSION, vol. 62, ISSN: 1361-6587

D. Batani, L. Antonelli, F. Barbato, G. Boutoux, A. Colaïtis, J.-L. Feugeas, G. Folpini, D. Mancelli, Ph. Nicolai, J. Santos, V. Tikhonchuk, J. Badziak, T. Chodukowski, K. Jakubowska, Z. Kalinowska, T. Pisarczys, M. Rosinski, M. Sawicka, Baffigi F, G. Cristoforetti, F. D'Amato, P. Koester, L.A.Gizzi, S. Viciani, S. Atzeni, M.Skoric, S. Guskov, R. Dudzak, Y. J. Gu, J. Limpouch, et al. (2019). Progressing in understanding the role of hot electrons for the shock ignition approach to Inertial Confinement Fusion. NUCLEAR FUSION, vol. 59, ISSN: 1741-4326

G. Cristoforetti, L. Antonelli, D. Mancelli, S. Atzeni, Baffigi F, F. Barbato, D. Batani, G. Boutoux, F. D'Amato, J. Dostal, R. Dudzak, E. Filippov, Y. J. Gu, L. Juha, O. Klimo, M. Krus, S. Malko, A. S. Martynenko, Ph. Nicolai, V. Ospina, S. Pikuz, O. Renner, J. Santos, V. T. Tikhonchuk, J. Trela, S. Viciani, L. Volpe, S. Weber, and L. A. Gizzi (2019). Time evolution of stimulated Raman scattering and two-plasmon decay at laser intensities relevant for shock ignition in a hot plasma. HIGH POWER LASER SCIENCE AND ENGINEERING, vol. 7, ISSN: 2052-3289

G. Toci, L. A. Gizzi, P.Koester, Baffigi F, L. Fulgentini, L. Labate, A. Hospodkova, V. Jary, M. Nik, and M. Vannini (2019). InGaN/GaN multiple quantum well for superfast scintillation application: photoluminescence measurements of the picosecond rise time and excitation density effect. JOURNAL OF LUMINESCENCE, vol. 208, p. 119-124, ISSN: 0022-2313

L. Antonelli, J. Trela, F. Barbato, G. Boutoux, Ph. Nicolaï, D. Batani, V. Tikhonchuk, D. Mancelli, A. Tentori, S. Atzeni, A. Schiavi, Baffigi F, G. Cristoforetti, S. Viciani, L. A. Gizzi, M. Smid, O. Renner, J. Dostal, R. Dudzak, L. Juha, and M. Krus (2019). Laser-driven strong shocks with infrared lasers at intensity of 1016 W/cm2. PHYSICS OF PLASMAS, vol. 26, ISSN: 1070-664X

G. Cristoforetti, L.Antonelli, S.Atzeni, Baffigi F, F. Barbato, D.Batani, G. Boutoux, A. Colitis, J.Dostal, R. Dudzack, L.Juha, P. Koester, A.Marocchino, D.Mancelli, Ph. Nicolai, O.renner, J.J. Sanots, A.Schiavi, M. skoric, M.Smid, L.A. Gizzi (2018). Measurements of parametric instabilities at laser intensities relevant to strong shock ignition,. PHYSICS OF PLASMAS, vol. 25, ISSN: 1089-7674

L.A. Gizzi, Baffigi F, F. Brandi, GC Bussolino, G. Cristoforetti, A. Fazzi, L. Fulgentini, D. Giove, P. Koester, L. Labate, G. Maero, D.

Palla, M. Romé, P.Tomassini (2018). Light Ion Acceleration Line (L3IA): Test Experiment at ILIL-PW. NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH. SECTION A, ACCELERATORS, SPECTROMETERS, DETECTORS AND ASSOCIATED EQUIPMENT, vol. 909, p. 160-163, ISSN: 1872-9576

T. Pisarczyk, S.Yu. Gus'kov, R. Dudzak, O. Renner, D. Batani, T. Chodukowski, Z. Rusiniak, J.Dostal, N.N. Demchenko, M. Rosinski, P. Parys, M. Smid, Ph. Korneev, E. Krousky, S. Borodziuk, J. Badziak, L. Antonelli, L. Gizzi, G. Cristoforetti, P. Koester, Y. Maheut, L. Volpe, Baffigi F, T. Levato, J. Skala, A. Zaras-Szydlowska, J. Trela, D. Mancelli, J. Ullschmied, M. Pfeifer, et al. (2018). Wavelength dependence of laser plasma interaction related to shock ignition approach. LASER AND PARTICLE BEAMS, vol. 36, p. 405-426, ISSN: 0263-0346

G. Cristoforetti, A. Colaitis, L. Antonelli, S. Atzeni, Baffigi F, D. Batani, F. Barbato, G. Boutoux, R. Dudzak, P. Koester, E. Krousky, L. Labate, Ph. Nicolai, O. Renner, M. Skoric, V. Tikhonchuk and L. A. Gizzi (2017). Experimental observation of parametric instabilities at laser intensities relevant for shock ignition. EUROPHYSICS LETTERS, vol. 117, p. 35001-1-35001-6, ISSN: 1286-4854

G. Cristoforetti, L. Antonelli, S. Atzeni, Baffigi F, F. Barbato, D. Batani, G. Boutoux, A. Colaitis, J. Dostal, R. Dudzak, L. Juha, P. Koester, D. Mancelli, O. Renner, M. Skoric, V. Tikhonchuk, S. Viciani, L. A. Gizzi (2017). “Experimental investigation on parametric instabilities at PALS at intensities relevant to shock ignition. In: Proceedings of IFSA 2017, 10th International Conference on Inertial Fusion Sciences and Applications, .

G. Cristoforetti, P. Londrillo, P. Singh, Baffigi F, G. D'Arrigo, A. Lad, R. Gabriella Milazzo, A. Adak, M. Shaikh, D. Sarkar, G. Chatterjee, J. Jha, M. Krishnamurthy, G Ravindra Kumar and L. Gizzi (2017). Transition from Coherent to Stochastic electron heating in ultrashort relativistic laser interaction with structured targets". SCIENTIFIC REPORTS, vol. 7:1479, ISSN: 2045-2322

L. A. Gizzi, S. Atzeni, Baffigi F, F. Brandi, D. Calestani, G. Cantono, T. Ceccotti, G. Cristoforetti, A. Faenov, F. Gorelli, P. Koester, L. Labate, P. Londrillo, M. Santoro, A. Schiavi, M. Villani (2017). Gigabar shock with femtosecond irradiation of nanoengineered targets. In: (a cura di): IFSA, Proceedings of IFSA 2017, 10th International Conference on Inertial Fusion Sciences and Application. IFSA, Saint Malo- France, 11-15 settembre 2017

L.A.Gizzi, Baffigi F, F.Brandi, G.Bussolino, G.Cristoforetti, A.Fazzi, L.Fulgentini, D.Giove, P.Koester, L.Labate, G.Maero, M.Romé, P.Tomassini (2017). Light ions acceleration line (L3IA): test experiments at ILIL-PW. In: (a cura di): EAAC, Proceedings of 3rd European Advanced Accelerator Concept Workshop. Isola d'Elba, 24-30 settembre 2017

L.A.Gizzi, Baffigi F, F.Brandi, G.Bussolino, L.Fulgentini, P.Koester, L.Labate, D.Palla, D.Terzani, P. Tomassini, G.Vantaggiato (2017). High quality laser wakefield acceleration: design and implementation at ILIL-PW”. In: (a cura di): EAAC, 33rd European Advanced Accelerator Concept Workshop. Isola d'Elba, 24-30 settembre 2017

P. Londrillo, S. Atzeni, BAFFIGI F, F. Brandi, D. Calestani, F. Gorelli, P. Koester, L. Labate, Amit D. Lad, D. Sarkar, M. Santoro, M. Villani, G.R. Kumar, L.A. Gizzi (2017). Transition from Coherent to Stochastic electron heating in ultrashort relativistic laser interaction with structured targets and possible applications". In: (a cura di): CNISM, Proceedings of FisMat 2017. Trieste

P. Londrillo, S. Atzeni, Baffigi F, F. Brandi, D. Calestani, T. Ceccotti, G. D'Arrigo, F. Gorelli, P. Koester, L. Labate, Amit D. Lad, D. Sarkar, M. Santoro, M. Villani, G.R. Kumar, L.A. Gizzi (2017). Transition from Coherent to Stochastic electron heating in ultrashort relativistic laser interaction with structured targets and possible applications. In: Proceedings of FisMat 2017. Miramare (TS), 1–5 Ottobre, 2017

] L.A.Gizzi, Baffigi F, F.Brandi, G.Bussolino, L.Fulgentini, P.Koester, L.Labate, D.Palla, D.Terzani, P. Tomassini, G.Vantaggiato (2017). "High quality laser wakefield acceleration: design and implementation at ILIL-PW. In: 3rd European Advanced Accelerator Concept Workshop, . Isola D'Elba Italy, September 2017

D. Palla, Baffigi F, F. Brandi, L. Fulgentini, P. Koester, L. Labate, P. Londrillo, L. A. Gizzi, " (2016). Comparison of Self-Injection Thresholds in He and N2 and Role of Self-Focusing in LWFA. NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH. SECTION A, ACCELERATORS, SPECTROMETERS, DETECTORS AND ASSOCIATED EQUIPMENT, vol. 829, p. 408-412, ISSN: 1872-9576

L. Labate, M.G. Andreassi, Baffigi F, R. Bizzarri, A. Borghini, G. Bussolino, L. Fulgentini, F. Ghetti, A. Giulietti, P. Koester, D. Lamia, T. Levato, Y. Oishi, S. Pulignani, G. Russo, Giorgio, A. Sgarbossa, L. Gizzi (2016). LESM: a laser-driven sub-MeV electron source delivering ultra-high dose rate on biological samples. JOURNAL OF PHYSICS. D, APPLIED PHYSICS, vol. 49, ISSN: 1361-6463

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Premi e riconoscimenti

Premio/riconoscimento	technology Breakthrough (2018)
Assegnato da	INO Symposium 2018

Europass Curriculum Vitae

Personal information

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Current position

Senior researcher at Istituto Nazionale di Ottica, Consiglio Nazionale delle Ricerche (CNR), Pisa, Italy

Languages

Mother tongue(s) **Italian**

Self-assessment *European level*(*)	Understanding		Speaking		Writing
	Listening	Reading	Spoken interaction	Spoken production	
English	C1 Proficient user	C2 Proficient user	C1 Proficient user	C2 Proficient user	C2 Proficient user
French	B1 Independent user	B2 Independent user	A1 Basic user	A1 Basic user	A1 Basic user

(*) *Common European Framework of Reference (CEF) level*

Main scientific interests

- Optics of short and ultrashort lasers
- Laser-driven electron acceleration and X/γ-ray secondary sources
- Ultrashort and/or ultraintense laser-matter interaction
- Advanced optical/X-ray diagnostics of laser-plasmas
- Numerical simulations of (short/ultrashort) laser pulse generation and beam transport/focusing
- Laser-driven proton acceleration
- Experimental issues involved in the design, commissioning and operational management of small and medium scale laser facilities
- Medical applications of novel concept (laser-driven) electron accelerators
- Laser-matter interaction in Inertial Confinement Fusion relevant regimes (plasma instabilities, fast electron transport, etc.)
- Numerical simulations of laser-plasma interaction (using hydro and PIC codes) and particle transport/interaction (Monte Carlo GEANT4 code)

Computer skills

Operating systems: Linux (preferred), MacOS, Windows
Programming languages: C/C++ (excellent), python (very good), LabView© (very good), Mathematica© programming (very good), bash/z shell scripting (good)
Scientific libraries: CUDA (parallel programming on GPUs), GEANT4, GSL - Gnu Scientific Library, FFTW (Fast Fourier Transform), python math/numerical libraries (matplotlib, numpy, scipy, simpy, etc.)
Scientific software: LabView©, Mathematica©, gnuplot, paraview, MIRO (simulation of optics and laser systems), gUPPE (simulation framework for femtosecond nonlinear optics), python/matplotlib,numpy/scipy
Other software: LaTeX, OpenOffice/LibreOffice, Microsoft Office
Other: Arduino programming, QT library (C++ graphics/GUI library), Boost Asio library (C++ library for network and low-level I/O programming), Apache (web server) configuration

Teaching, awards and other scientific activities

▷ Referee for the following journals: *Applied Optics, Applied Physics B, Chinese Optics Letters, European Physical Journal Plus, Europhysics Letters, Journal of Physics B - At. Mol. Opt. Phys., Journal of Physics D - Applied Physics, High Power Laser Science and Engineering, Laser Part. Beams, New Journal of Physics, Nucl. Instrum. Meth. Phys. Res. A, Nucl. Instrum. Meth. Phys. Res. B, Nuclear Fusion, Optics Express, Optics Laser Technol., Phys. Rev. E, Phys. Rev. Lett., Plasma Phys. Controlled Fusion, Rev. Sci. Instrum., Scientific Reports*

▷ Lecturer for the class “Fisica degli acceleratori laser-plasma”, held at the Dept. of Physics of the Univ. of Pisa during the acedemic years 2019-2020, 2020-2021, 2021-2022, 2022-2023

▷ Lecturer for the class “Laboratorio di fisica 3”, held at the Dept. of Physics of the Univ. of Pisa during the academic year 2021-2022

▷ Since 2011 he is in charge of the laser systems hosted at the Intense Laser Irradiation Laboratory of the National Institute of Optics of the CNR (INO-CNR) (the laboratory features, among others, a 220TW TiSa system)

▷ Since 2019, member of the Editorial Board of the review “Quantum Beam Science”

▷ Elected member of the “Consiglio di Istituto” of the National Institute of Optics - CNR for the years 2017-2021

▷ Member of the Program Committee of the SPIE Conference “High Power Laser ”, held in Prague (Czech Republic) on April 19-22, 2021

▷ Member of the Program Committee of the SPIE Conference “High-power, high-energy and high-intensity laser technology”, held in Prague (Czech Republic) on April 1-4, 2019

▷ 2011: he received, as Principal Investigator, a funding of 540k€ (total project cost 747k€) from the italian Ministry of Health through the call for projects “Giovani Ricercatori” (“Young Researchers”), for a project in the field of medical applications of laser-driven electron beams

▷ since 2016 he acts as reviewer for projects funded by the italian National Institute of Nuclear Physics (INFN) (through the CSN5)

▷ Evaluator for a PhD thesis in the field of laser-driven particle acceleration, discussed in the academic year 2016-2017 at the University of Messina (Italy)

▷ Member of the Program Committee of the 4th EPS Conference on Plasma Physics, Espoo, Finland, 2013

▷ Supervisor of the PhD thesis work of the student Naveen C. Pathak (PhD program in Physics at the Department of Physics of the University of Pisa, final thesis title *Laser pulse propagation in plasmas and its implication of frequency upshift and electron acceleration*, discussed on june 2011)

▷ Since 2007 he has served several times as a member of the examining board for the assignment of research grants in the field of laser-plasma interaction by the Consiglio Nazionale delle Ricerche

▷ Since 2007 he is associated ("associazione scientifica") with the Pisa Section of the italian National Institute of Nuclear Physics (INFN)

▷ He was awarded for the 2nd best presentation in the Section "Biophysics and Medical Physics" at the 100th national congress of the Italian Society of Physics (SIF), held in 2014

▷ He acted as the scientific responsible for post-doc research grants assigned in the years 2013-2015 to dr. M. Cresci, dr. P. Koester, dr. T. Levato and dr. S. Pulignani, in the framework of the project "Giovani Ricercatori" funded by the italian Ministry of Health, for research activities in the field of laser-driven electron acceleration.

▷ He acted as scientific responsible of 4 post-doc research grants assigned in the years 2013-2015 for research activities in the field of laser-driven electron acceleration

▷ He acted as scientific responsible for a post-doc research grant assigned since 01/11/2012 to 31/10/2014 for a scientific activity in the field of optics of ultrashort lasers

▷ "Outstanding referee" for the review *Rev. Sci. Instrum.* in the year 2010

▷ Responsible for the operational management of the 250TW laser system and responsible for the laser beam modelling, control, diagnostics and focusing in the Target Area of the "FLAME (Frascati Laser for Acceleration and Multidisciplinary Experiments)" laboratory, during its commissioning phase at the Laboratori Nazionale di Frascati in the framework of the INFN (Istituto Nucleare di Fisica Nucleare) strategic project "PLASMONX (Plasma Acceleration and Monochromatic X-ray generation)"

▷ Research fellow at the Institüt für Optik und Quantenelektronik of the Friedrich-Schiller-Universität, Jena (Germany), from 01/12/2012 to 30/04/2013

Responsibility of scientific projects

▷ Scientific Coordinator for the CNR for the PNRR IR project "EuAPS" (started in Dec 2022)

▷ Scientific coordinator of the INFN - Pisa unit for the INFN project "LPA2" (started in 2020)

▷ Scientific coordinator of the CNR - Pisa unit for the project "Preclinical Tool for Advanced Translational Research with Ultrashort X-ray Pulses" funded by the italian Ministry of Research through the call MIUR PRIN2015 (project duration 2017-2020)

▷ Member of the Steering Committee, participation as "WP expert" to the WP4 ("Laser design and optimization") and participation to the WP3 ("High gradient laser plasma acceleration bunches") of the european project "EuPRAXIA", aimed at producing a CDR for a laser-driven accelerator and FEL (funded in the framework of the H2020 program) 2016-2019

▷ Principal Investigator of the project *Study of radiobiological and radiotherapic effects of a novel laser driven electron accelerator*, funded by the italian Ministry of Health in the call "Giovani Ricercatori 2009" (total budget k€ 747, total funding from the Ministry of Health k€ 540), project duration February 2012 - January 2016

▷ Scientific coordinator of the INFN - Pisa unit for the INFN project "SiCilia" (project duration 01/01/2016 - 31/12/2018)

▷ Work Package 5 ("Radiobiological Testing Facility") leader within the INFN CNS5 experiment "L3IA - Line for Laser Light Ions Acceleration", started in 2016

▷ Scientific Coordinator for the italian participation to the Joint Research Activity "European Research Objectives on Lasers for Industry, Technology and Energy (EURO-LITE)" in the framework of the EC project "LASERLAB Europe" (June 2012 - November 2015, total funding allocated for Italy k€ 40)

▷ WP2 ("Laser-plasma diagnostic") leader in the years 2014-2015 for the INFN project "PLASMAMED"

▷ Scientific coordinator of the project *AdOpRad - R&D of innovative wavefront sensors and adaptive optics for laser-driven radiological devices*, funded by the Tuscany Region (project duration 01/11/2012 - 31/10/2014)

▷ Scientific Coordinator for the italian side of the Executive Program of Cooperation in the Field of Science and Technology between Italy and Japan on the *Study of laser pulse guiding conditions for laser-plasma acceleration* (years 2008 and 2009)

Participation to conferences/seminars as invited speaker

- Invited seminar at INFN, Sezione di Pisa, 11 January 2022. Title: *Laser-driven particle acceleration: Perspectives for medical applications*
- Invited seminar at ELI-NP (Romania), 15 December 2021. Title: *VHEE applications of LWFA generated electrons*
- Advanced Summer School on "Laser-Driven Sources of High Energy Particles and Radiation", held in Capri, Italy on 9-16 July 2017. Lectures on *Ultrafast, intense laser pulse diagnostics*
- EXTATIC welcome week 2017, Trieste, Italy, 16-20 January 2017. Title of the talk: *Laser-driven electron acceleration and secondary X/γ-ray sources*
- 3rd ELIMED workshop on Medical and multidisciplinary applications of laser-driven ion beams at ELI-Beamslines, Catania, Italy, 7-10 September 2016. Title of the talk: *Line for Laser-driven Light Ions Acceleration (L3IA) at ILIL and related TNSA studies*
- International Conference on High Energy Density Sciences 2015, Yokohama, Japan, 22-24 April 2015. Title of the talk: *A small-scale laser-driven electron accelerator for radiobiology experiments at ILIL-CNR*
- FisMat2015, Palermo, Italy, September 28 - October 2, 2015. Title of the talk: *Role of laser polarization on stable injection of laser-plasma acceleration at high dose for radiobiology applications*
- SPIE Optics+Optoelectronics 2013 Conference, Prague, Czech Republic, April 15-18, 2013. Title of the talk: *Small-scale laser based electron accelerators for biology and medicine: a comparative study of the biological effectiveness*
- 17th International Conference on Atomic Processes in Plasmas, 19-22 july 2011, Belfast (UK). Title of the talk: *X-ray spectroscopy and charged particles with small-scale lasers*

• 4th International Conference on Superstrong Fields in Plasmas, Varenna, Italy, September 3-9, 2010. Title of the talk: *PLASMONX project: the FLAME laser and the test experiment at LNF-INFN*

Peer-reviewed publications

▷ H-index: 24 (*WoS* database as of February 2022), 26 (*google scholar* database as of February 2000)

▷ Author of more than 120 peer-reviewed publications and 40 conference proceedings, book chapters, etc.

Selected publications

■ L.A. Gizzi, L. Labate *et al.*, *Overview and specifications of laser and target areas at the Intense Laser Irradiation Laboratory*, High Power Laser Sci. Eng **9**, e10 (2021)

■ L.A. Gizzi, E. Boella, L. Labate *et al.*, *Enhanced laser-driven proton acceleration via improved fast electron heating in a controlled pre-plasma*, Sci. Rep. **11**, 13728 (2021) (corresponding author)

■ L. Labate *et al.*, *Toward an effective use of laser-driven very high energy electrons for radiotherapy: Feasibility assessment of multi-field and intensity modulation irradiation schemes*, Sci. Rep. **10**, 17307 (2020)

■ D. Panetta, L. Labate *et al.*, *Numerical simulation of novel concept 4D cardiac microtomography for small rodents based on all-optical Thomson scattering X-ray source*, Sci. Rep. **9**, 8439 (2019) (corresponding author)

■ L. Labate, G. Vantaggiato, L. A. Gizzi, *Intra-cycle depolarization of ultraintense laser pulses focused by off-axis parabolic mirrors*, High Power Laser Sci. Eng. **6**, e32 (2018)

■ M. G. Andreassi, ..., L. Labate, *Radiobiological Effectiveness of Ultrashort Laser-Driven Electron Bunches: Micronucleus Frequency, Telomere Shortening and Cell Viability*, Rad. Res. **186**, 245 (2016)

■ L. Labate *et al.*, *LESM: a laser-driven sub-MeV electron source delivering ultra-high dose rate on thin biological samples*, J. Phys. D - Appl. Phys. **49**, 275401 (2016)

■ N. Booth, ..., L. Labate *et al.*, *Laboratory measurements of resistivity in warm dense plasmas relevant to the microphysics of brown dwarf*, Nature Commun. **6**, 8742 (2015)

■ P. Ferrara, ... L.Labate *et al.*, *3-D numerical simulation of Yb:YAG active slabs with longitudinal doping gradient for thermal load effects assessment*, Optics Express **22**, 5375 (2014) (corresponding author)

■ T. Ceccotti, ..., L. Labate *et al.*, *Evidence of resonant surface-wave excitation in the relativistic regime through measurements of proton acceleration from grating targets*, Phys. Rev. Lett. **111**, 185001 (2013)

Pisa (Italy), 01/07/ 2024

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