

Europass Curriculum Vitae



Personal information

Name / Surname	Lucchini Matteo
Telephone	+39 02 2399 6591 (office)
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Personal Email	matteo.lucchini@polimi.it
Nationality	Italian
Date of birth	29/01/1984
Gender	Male

Work experience

Date	29/11/2022 → <i>today</i>
Position	Associate Professor
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy
Main activities and responsibilities	I am responsible for the research activity performed in the three laboratories for femtosecond and attosecond ultrafast spectroscopy. I directly manage a team composed by a Post-Doc (to start next summer) an average number of 3 PhD students and several Master's and Bachelor's students.
Date	29/11/2019 – 28/11/2022
Position	Senior assistant professor (RTDB)
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy
Date	13/02/2017 – 28/11/2019
Position	Junior assistant professor (RTDA)
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy
Date	01/02/2012 – 31/01/2017
Position	Post-Doc researcher in Physics
Institute name and address	ETH Zürich, Physics Department, Institute of Quantum Electronics Auguste-Piccard-Hof 1, 8093 Zurich, Switzerland

Date	29/02/2016 – 08/03/2016
Position	Short term visitor by the group of Prof. Kaoru Yamanouchi
Institute name and address	The Tokyo University, School of Science, Chemistry department 7 Chome-3-1 Hongo, Bunkyo, Tokyo 113-8654, Japan 01/01/2009 – 31/01/2012
Date	
Position	PhD student in Physics
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy 02/09/2009 – 02/10/2009
Date	
Position	Short term visitor by the group of Prof. Marc J.J. Vrakking
Institute name and address	AMOLF institute Science Park 104, 1098 XG Amsterdam, the Netherlands 23/02/2009 – 27/02/2009
Date	
Position	Short term visitor by the group of Prof. Konstantin Simeonidis
Institute name and address	Max Planck Institute for Nuclear Physics Saupfercheckweg 1, 69117 Heidelberg, Germany 01/03/2008 – 17/12/2008
Date	
Position	Master's student in Physics Engineer by the group of Prof. Mauro Nisoli
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy <i>academic year: 2008-2009</i>
Date	
Position	Internship in the class of saxophone of M ^o . Franco Brizzi
Institute name and address	Music Conservatory Giuseppe Verdi Via Luigi Cadorna 4, 22100 Como, Italy

Education and training

Date	07/03/2012
Qualification awarded	PhD in Physics
Final score	<i>Magna cum laude</i>
Principal subjects covered or skills acquired	Generation and characterisation of ultrashort pulses in the extreme-ultraviolet. Application of attosecond and femtosecond pump-probe techniques to atoms and molecules in gas phase.
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy 17/12/2008
Date	
Qualification awarded	Master's Degree in Physics Engineering
Final score	<i>110 Magna cum laude/110</i>
Principal subjects covered or skills acquired	Fundamental Physics, Ultrafast Optics, Solid-state Physics, Electronics
Institute name and address	Politecnico di Milano, Physics Department Piazza Leonardo da Vinci 32, 20133 Milan, Italy 29/09/2008
Date	
Qualification awarded	Master's Degree in Classical Saxophone
Final score	<i>10 Magna cum laude/10</i>
Principal subjects covered or skills acquired	Music History, Musical Theory and Harmony, Classical Saxophone
Institute name and address	Music conservatory Giuseppe Verdi

Via Luigi Cadorna 4, 22100 Como, Italy
27/07/2006

Date
Qualification awarded Bachelor's Degree in Physics Engineering
Final score 110 *Magna cum laude*/110
Principal subjects covered or skills acquired Fundamental Physics, Ultrafast Optics, Solid-state Physics, Electronics, Automatics, Computer Science
Institute name and address Politecnico di Milano, Physics Department
Piazza Leonardo da Vinci 32, 20133 Milan, Italy

01/07/2003

Date
Qualification awarded Diploma of secondary school with an emphasis on sciences
Final score 100/100
Principal subjects covered or skills acquired Secondary school with an emphasis on sciences
Institute name and address I.S.I.S "Edith Stein"

Via dei Gelsomini 2, 21026 Gavirate, Italy

Professional skills

Mother tongue

Italian

Other language(s)

*Self-assessment
European level^(*)*

English

German

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
C1 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user
B1 Independent user	B1 Independent user	B1 Independent user	B1 Independent user	B1 Independent user

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

Technical skills

Ultra-high vacuum technology and solid-state laser technology. Technology for the realisation of optical "pump-probe" time-resolved measurements. Measurements techniques for the detection of photo-electrons and positively charged photo-fragments for the implementation of mass spectrometry or angular resolved photo-emission spectrometry. Research interests: time-resolved atomic and molecular physics, electron dynamics in atoms, molecules and solids, light-matter interaction in metals and semiconductors unfolding on time scales of few femtoseconds or attoseconds.

Computer skills

- Advanced knowledge of the operative systems: Windows, Linux, Mac OS X
- Advanced knowledge of the software for data analysis: Microsoft Office™(Word™, Excel™, Powerpoint™), OriginPro™, MATLAB, Derive, L^AT_EX.
- Basic knowledge of the programming languages: C e C++
- Advanced knowledge of the programming languages: LabVIEW™and MATLAB
- Advanced knowledge of the software for 3D and vector graphics: CorelDRAW and blender™

Driving licence(s)

European driving licences A and B

Honours and awards

Date	12/07/2021
Award/fellowship	Antonio Feltrinelli Giovani 2021 per la Fisica
Description	The prize is awarded to an Italian scholar - under the age of 40 - who have achieved results of outstanding originality, independence and international significance.
Institute name and address/organisation	Accademia Nazionale dei Lincei, Rome, Italy
Date	25/06/2019
Award/fellowship	Fresnel Prize 2019
Description	The award is for outstanding contributions to quantum electronics and optics made by young scientists before the age of 35.
Institute name and address/organisation	European Physical Society, Quantum Electronics and Optics Division
Date	20/06/2019
Award/fellowship	Alfredo di Braccio for physicists 2019
Description	The award is given to exceptional young Italian researchers (below 35 years hold) for outstanding research in Physics
Institute name and address/organisation	Accademia Nazionale dei Lincei, Rome, Italy
Date	30/03/2018
Qualification awarded	Italian qualification as associated professor in experimental physics of matter (Abilitazione Scientifica Nazionale)
Evaluation	<i>Able</i>
Details	Awarded of national qualification to be an university professor: "Abilitazione scientifica nazionale, bando D.D. 1532/2016, settore concorsuale 02/B1, Fisica Sperimentale della Materia, II fascia.
Institute name and address	MIUR - ministero istruzione università ricerca (Italian ministry of university and research) Viale Trastevere, 76/a - 00153 Rome, Italy
Date	27/02/2018
Award/fellowship	FFABR - Finanziamento delle attività base di ricerca
Description	An award of 3k€ given to young and outstanding researchers
Institute name and address/organisation	MIUR - Italian ministry of university and research, Rome, Italy
Date	20/10/2011
Award/fellowship	2 nd ISUILS Awards for Young Researchers
Description	The award is given to exceptional young researchers in the field of intense-laser science
Institute name and address/organisation	Japan Intense Light Field Science Society (JILS), Tokyo, Japan

Fellowships

I won the three fellowships listed below. Two of these were meant to cover my salary and a part of the costs for laboratory material and equipment. The last one was meant to cover the expenses associated with a conference participation.

2012 – 2014

Date	
Award/fellowship	Winner of the ETH Zurich Post-Doctoral fellowship (Marie-Curie cofunded)

Description	The program is intended to foster high-potential, young researchers who have already demonstrated excellence in terms of internationally competitive achievements in the early stages of their professional careers.
Institute name and address/organisation	ETH Zürich, Rämistrasse 101, 8092 Zurich, Switzerland
Date	01 – 06/07/2012
Award/fellowship	Selected as attendee for the 62 nd Lindau Nobel Laureate Meeting
Description	Nobel Laureates convene at Lindau to meet the next generation of leading scientists: undergraduates, PhD students, and Post-Doc researchers from all over the world. The Lindau Nobel Laureate Meetings foster the exchange among scientists of different generations, cultures, and disciplines.
Date	01/01/2009 – 31/01/2012
Award/fellowship	Research grant titled: “Imaging ad attosecondi di pacchetti elettronici in atomi” (attosecond imaging of electron wave packets in atoms)
Description	Research grant to cover my salary during the three years of PhD in Physics
Institute name and address/organisation	Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milan, Italy

Educational skills

Starting from the academic year 2008/2009 I was an assistant lecturer (exercise classes and laboratories) for more than 20 university classes of Physics (total of 108 CFU), first by the Politecnico di Milano and then by the ETH Zürich. Besides the basic courses of Physics for the Bachelor's studies, I was assistant lecturer for two classes of Optics for the Master's studies: “Photonics” for the Master's Degree in Physics Engineering at the Politecnico di Milano and “Ultrafast Laser Physics” for the Master's Degree in Physics at the ETH Zürich. For the latter course I gave a four hours lecture on attosecond science and high-order harmonic generation. All the teachings at ETH have been held in English.

Currently, at Politecnico di Milano, I teach the exercise classes of “Photonics” for the Master's Degree in Physics Engineering (10 CFU, held in English) and the lecture classes for the course of “Physics I” for the first year students of Engineering (12 CFU, held in Italian).

Finally, I have been invited as a lecturer to the following summer schools: “PALM International School 2018, Attosecond Science: from ultrafast sources to applications” which took place in Gif-sur-Yvette near Paris - 28 May to 01 June 2018; “Winter school of experimental molecular dynamics & kinetics” - 22nd to 24th February 2021; at a round table of discussion for young scientists at the “Attochem young scientist symposium (YSS) 2021 - 17th September 2021”; international school “Attosecond School: the Frontiers of Attosecond and Ultrafast X-ray Science” - 21st to 25th March 2022

; international school of quantum electronics “The frontiers of attosecond and ultrafast X-ray science” - 26th to 31st March 2023.

Research activity

Since my Master at Politecnico, I have been researching in the framework of the *attosecond science*. The topics covered range from the implementation of new techniques for the generation of isolated attosecond pulses to the application of such pulses to pump-probe measurements in atoms, molecules and solids.

Communication skills

Every year the Scientific Community organises conferences and conventions where the major research results are presented as posters or talks. In the past years I took part to several international conferences (please see the corresponding section). This helped me to sharpen considerably my communication and presentation skills.

Major scientific contributions

In the following I list the major scientific outcomes obtained so far:

- Invention of the Ionisation Gating technique for the selection of high-energy isolated attosecond pulses (publication [3]).
- First application of the RABBITT measurement technique to solid targets (publication [19]).
- First application of coincidence detection to study photoemission delays in atoms (publication [22]).
- First demonstration of ultrafast electron screening on attosecond time scales in metals like copper (publication [23]).
- First observation of virtual electron dynamics (time-resolved dynamical Franz-Keldysh effect) in the petahertz regime in dielectrics (publication [27]).
- First experimental demonstration of the validity of the effective mass model in noble metals under strong non-equilibrium conditions on attosecond time scales (publication [32]).
- Generation and characterization of the shortest extreme-ultraviolet pulses ever selected with a time-delay compensated monochromator (publication [35]).
- First experimental demonstration of boosted carrier injection in semiconductors (GaAs) by virtual electrons (publication [36]).
- First experimental observation of the role of coupled electron and nuclear dynamics on the photoemission timing (publication [38]).
- First experimental observation of the role of initial electron localization in the photoemission process of CO molecules (publication [39]).
- New holographic technique for the characterization of attosecond pulses (publication [42]).
- Observation of ultrafast screening mediated by electron localization in Ti (publication [44]).
- First observation of the dual atomic-bulk nature of Wannier-Mott excitons in dielectrics (publication [50]).
- First experimental observation of sub-fs charge injection dynamics in Ge (publication [63]).

Research projects

Date	09/12/2022 – 08/12/2026
Project	FARE 2020: “PHase Transition Ultrafast dyNAMics in Mott insulators (PHorTUNA)”
Description	Framework for the attraction and reinforcement of research excellence in Italy1 - III edition (Prot. R209LXZRSL). Duration 3 years.
Role	Principal investigator
Date	01/02/2020 – 31/01/2025
Project	ERC starting call 2019: “Attosecond Dynamics in AdvanCed matERials (AuDACE)”
Description	Grant founded by the European community for 5-year ground-breaking scientific projects. Grant agreement No. 848411
Role	Principal investigator
Date	25/10/2019 – 24/10/2023

Project Description	COST action: AttoChem The AttoChem network will coordinate experimental and theoretical efforts to exploit the large potential of attosecond techniques in chemistry, with the aim of designing new strategies for the control of charge migration in molecules by directly acting on the attosecond time scale.
Role	Italian representative within the Management Committee 19/08/2019 – 18/08/2022
Date	
Project Description	PRIN 2017: “Attosecond transient absorption and reflectivity for the study of exotic materials (aSTAR)” Scientific project shared between different Italian universities and research centres to develop attosecond spectroscopy in solids. Total funds 1’102.5 k€ (176 k€ assigned to my unit).
Role	Coordinator of the Politecnico di Milano unit (beneficiary) <i>I have been principal investigator of a research project that lasted for two years.</i>
Date	01/09/2012 – 31/08/2014
Project Description	ETH Fellowship: “Attosecond time-resolved spectroscopy” Funds to cover a 2-year Post-Doc salary at ETH and part of the expenses for laboratory equipment. Total funds 218 kCHF. (~196.5 k€)
Role	Principal investigator <i>I actively took part to 9 research projects. I wrote, fully or partially, the scientific proposal of 4 of those.</i> 2017 → <i>ongoing</i>
Date	
Project Description	Extreme Light Infrastructure - ESFRI Roadmap Research project funded by Italian MIUR. Total funds 744 k€.
Role	Participant 2015 → <i>ongoing</i>
Date	
Project Description	Laserlab IV: The integrated initiative of European Laser Research Infrastructures IV LASERLAB-EUROPE IV is a consortium of lasers and research facilities made by almost all the nations members of the European Community. Total funds 433 k€.
Role	Participant 2018 → <i>ongoing</i>
Date	
Project Description	Design, build and test an XUV monochromator Funding source: ELI-ALPS, Hungary Non-Profit Ltd. Total funds 410 k€.
Role	Participant, I wrote the proposal 27/11/2015
Date	
Project Description	Scientific Equipment Proposal (SEP): “Attosecond surface science chamber” Research project funded by ETH Zürich with the aim to build a dedicated end-station for time-resolved ARPES measurements. Total funds 450 kCHF (~406 k€).
Role	Participant, I wrote the proposal 01/02/2012 – 30/06/2018
Date	
Project Description	NCCR MUST (Molecular Ultrafast Science and Technology), phase II Interdisciplinary research program funded by the Swiss National Science Foundation. Total funds 1’301 kCHF (~1’189 k€).
Role	Participant, I wrote part of the proposal 01/02/2012 – 30/06/2018
Date	
Project	NCCR MUST, phase II – ETH matching funds

Description	Matching funds from ETH Zürich. Total funds 1'560 kCHF (~1'425 k€).
Role	Participant, I wrote part of the proposal
Date	01/04/2009 – 31/01/2012
Project	ERC ELYCHE: "Electron-scale dynamics in chemistry" (Grant Agreement number: 227355)
Description	The project aims to demonstrate experimentally the possibility to control the electron motion in matter on attosecond time scales and in a coherent way. Particular importance is given to biologically relevant molecules. Total funds 2'446.2 k€.
Role	Participant
Date	01/03/2009 – 31/01/2012
Project	FP7-INFRASTRUCTURES-2008-1: "LASERLAB-EUROPE II: The Initiative of European Laser Research Infrastructures II"
Description	LASERLAB-EUROPE II is a consortium of lasers and research facilities made by almost all the nations members of the European Community. Total funds 439.891 k€.
Role	Participant
Date	01/2010 – 12/2010
Project	Progetto Cariplo 2009-2562 - Ricerca scientifica e tecnologica sui materiali avanzati
Description	Title of the project: "Local microtailoring of conjugated polymer emission by spatially resolved nanoparticles implantation for next-generation light-emitting devices". Total funds 127.5 k€.
Role	Participant

Invited seminars

	<i>I have been invited to held two seminars in international research centres</i>
Date	31/05/2023
Position	Invited by the organizing committee to give a seminar within the series "Photon Science Seminar"
Institute name and address	SLAC National Accelerator Laboratory 2575 Sand Hill Rd., Menlo Park, California, USA
Date	22/04/2022
Position	Invited by the organizing committee to give a seminar
Online event	Quantum Battles: Atto Fridays Seminar Series
Date	10/09/2021
Position	Invited by the group of Prof. Xiaochun Gong to give an online seminar
Institute name and address	State Key Laboratory of Precision Spectroscopy, East China Normal University 500 Dongchuan Road, Minhang District, Shanghai, China
Date	17/01/2019
Position	Invited by the group of Prof. Francesca Calegari to give a CFEL seminar
Institute name and address	Max Plank Institute for the Structure and Dynamics of Matter Notkestrasse 85, 22607 Hamburg, Germany
Date	24/11/2016
Position	Invited by the group of Prof. Angel Rubio to give a CFEL seminar
Institute name and address	Max Plank Institute for the Structure and Dynamics of Matter Notkestrasse 85, 22607 Hamburg, Germany

Research students supervised

During my post-Doc at ETH Zurich and my PhD at Politecnico di Milano, I supervised the work of 4 Master's students and 4 Bachelor's students. Since I started my position in Milano I supervised and cosupervised several Master's students. In Zurich and Milano, I supervised/ am supervising the work of 15 PhD students.

Commission of trust

Membership

Since 2023, member of the Centro Interdisciplinare Linceo Giovani within the Accademia dei Lincei.

Referee for international scientific journals

I am referee for the following scientific journals (in square brackets the value of the journal *impact factor* [I.F.] for the year 2021):

Nature [I.F. 69.504], Nature Photonics [I.F. 39.728], Nature Communications [I.F. 17.694], Physical Review X [I.F. 14.417], Physical Review Letters [I.F. 9.185], Physical Review A [I.F. 2.917], Physical Review Research [I.F. expected in 2022], Optica [I.F. 10.664], Communications Physics [I.F. 6.497], Journal of Physical Chemistry Letters [I.F. 6.888], Journal of Physical Chemistry A [I.F. 2.944], New Journal of Physics [I.F. 3.716], Optics Express [I.F. 3.833], Journal of Physics B-Atomic Molecular and Optical Physics [I.F. 1.665], Review of Scientific Instruments [I.F. 1.843], Optics Communication [I.F. 2.335], Photonics [I.F. 2.536], Applied Physics B [I.F. 2.1719], OSA Continuum [I.F. -], Chemical Physics Letters [I.F. 2.719], Scientific Reports [I.F. 4.996].

Proposals reviewer

I am an external reviewer for the Marie Skłodowska-Curie cofund Fellowship Program FP-RESOMUS, for the Swiss National Science Foundation, the Deutsche Forschungsgemeinschaft (DFG), and the U.S. Department of Energy - Atomic, Molecular, and Optical Sciences Program. I am member of the ELI ERIC Peer Review Panel.

Guest Editor

I have been guest editor of the special issue "[Attosecond Science and Technology: Principles and Application](#)" for the journal "Applied Science".

Committee member

- Member of the [OSA Ultrafast Optical Phenomena Technical Group](#)

- Member of the sub-committee for the topic area CG - High-Field Laser and Attosecond Science, for the Conference on Lasers and Electro-Optics Europe (CLEO/Europe) and European Quantum Electronics Conference (EQEC)

Conference organization

OSA Ultrafast Optical Phenomena Technical Group Online Workshop, 25-29 May 2020

ResearcherID

[L-2007-2015](#)

ORCID

[0000-0001-6467-100X](#)

Google scholar

<https://scholar.google.it/citations?user=050WcylIAAAJ&hl=it>

International conferences

I am co-author of 155 contributions to international conferences divided in:

- 33 invited oral presentations, 17 of these were presented personally. One of those was selected as "*invited keynote*" talk;
- 69 regular oral contributions (3 selected as "*post-deadline*" talks). 16 of them have been presented personally;
- 53 posters, 10 of these were presented personally.

For more details please see the list at the end of this document.

Scientific publications

I am currently co-author of 115 scientific publications:

- 64 journal articles on international peer-reviewed journals in the fields of Physics and Chemistry. I am the first author of 15 of them, the last author of 9 of them and single author on one;
- 45 conference proceedings, of these 17 as first author, 2 as last author;
- 6 book chapters;
- 1 PhD thesis.

List of publications

Journal articles

- [64] G. Inzani, A. Eskandari-asl, L. Adamska, B. Moio, G. L. Dolso, N. Di Palo, L. J. D'Onofrio, A. Lamperti, A. Molle, R. C. A. Rozzi, Borrego-Varillas, M. Nisoli, S. Pittalis, A. Avella, **M. Lucchini**, "Photoinduced charge carrier dynamics in germanium", *Nuovo Cim. C-Colloq. Commun. Phys.* **46**, 110 (2023).
- [63] G. Inzani, L. Adamska, A. Eskandari-asl, N. Di Palo, G. L. Dolso, B. Moio, L. J. D'Onofrio, A. Lamperti, A. Molle, R. Borrego-Varillas, M. Nisoli, S. Pittalis, C. A. Rozzi, A. Avella, **M. Lucchini**, "Field-driven attosecond charge dynamics in germanium", *Nat. Photonics* **XX**, XXXXXX (2023).
- [62] M. Reduzzi, M. Pini, L. Mai, F. Cappenberg, L. Colaizzi, F. Vismarra, A. Crego, **M. Lucchini**, C. Brahms, J. C. Travers, R. Borrego-Varillas, M. Nisoli, "Direct temporal characterization of sub-3-fs deep UV pulses generated by resonant dispersive wave emission", *Opt. Express* **31**, 26854–26864 (2023). selected as editor's pick
- [61] **M. Lucchini**, "Floquet-based interpretation of RABBITT traces", *Phys. Rev. A* **108**, 013117 (2023).
- [60] G. L. Dolso, G. Inzani, N. Di Palo, B. Moio, F. Medeghini, R. Borrego-Varillas, M. Nisoli, **M. Lucchini**, "Versatile and robust reconstruction of extreme-ultraviolet pulses down to the attosecond regime", *APL Photonics* **8**, 076101 (2023). Selected as editor's pick.
- [59] T. Csizmadia, Z. Filus, T. Grósz, P. Ye, L. Gulyás Oldal, M. de Marco, P. Jójárt, I. Seres, Z. Bengery, B. Gilicze, **M. Lucchini**, M. Nisoli, F. Frassetto, F. Samparisi, L. Poletto, K. Varjú, S. Kahaly, B. Major, "Spectrally tunable ultrashort monochromatized extreme ultraviolet pulses at 100 kHz", *APL Photonics* **8**, 056105 (2023).
- [58] L. Carlini, F. Montorsi, Y. Wu, P. Bolognesi, R. Borrego-Varillas, A.R. Casavola, M.C. Castrovilli, J. Chiarinelli, D. Mocci, F. Vismarra, **M. Lucchini**, M. Nisoli, M. Garavelli, R. Richter, A. Nenov, L. Avaldi, "Electron and ion spectroscopy of Azobenzene in the valence and core shell", *J. Chem. Phys.* **158**, 054201 (2023).
- [57] **M. Lucchini**, M. Murari, G. Lucarelli, F. Frassetto, L. Poletto, B. Mignolet, F. Remacle and M. Nisoli, "Ultrafast relaxation of ethylene cation", *J. Phys. Chem. Lett.* **13**, 11169–11175 (2022).
- [56] **M. Lucchini**, F. Medeghini, Y. Wu, F. Vismarra, R. Borrego-Varillas, A. Crego, F. Frassetto, L. Poletto, S.A. Sato, H. Hübener, U. de Giovannini, Á. Rubio, M. Nisoli, "Controlling Floquet states on the femtosecond time scale", *Nat. Commun.* **13**, 7103 (2022).
- [55] F. Vismarra, R. Borrego-Varillas, Y. Wu, D. Mocci, M. Nisoli, **M. Lucchini**, "Ensemble effects on the reconstruction of attosecond pulses and photoemission time delays", *J. Phys. Photonics* **4**, 034006 (2022).
- [54] R. Borrego-Varillas, **M. Lucchini**, M. Nisoli, "Attosecond spectroscopy for the investigation of ultrafast dynamics in atomic, molecular and solid-state physics", *Rep. Prog. Phys.* **85**, 066401 (2022).
- [53] G. L. Dolso, B. Moio, G. Inzani, N. Di Palo, S.A. Sato, R. Borrego-Varillas, M. Nisoli, **M. Lucchini**, "Reconstruction of ultrafast exciton dynamics with a phase-retrieval algorithm", *Opt. Express* **30**, 12248-12267 (2022).
- [52] B. Moio, G. Dolso, G. Inzani, N. Di Palo, R. Borrego-Varillas, M. Nisoli, **M. Lucchini**, "Time-frequency mapping of two-colour photoemission driven by harmonic radiation", *J. Phys. B: At. Mol. Opt. Phys.* **54**, 154003 (2021).
- [51] R. Borrego-Varillas, **M. Lucchini**, "Reconstruction of atomic resonances with attosecond streaking", *Opt. Express* **29**, 9711–9722 (2021).
- [50] **M. Lucchini**, S.A. Sato, G.D. Lucarelli, B. Moio, G. Inzani, R. Borrego-Varillas, F. Frassetto, L. Poletto, H. Hübener, U. De Giovannini, A. Rubio, M. Nisoli, "Unravelling the intertwined atomic and bulk nature of localised excitons by attosecond spectroscopy", *Nat. Commun.* **12**, 1021 (2021).
- [49] P. Ye, T. Csizmadia, L. Gulyás Oldal, H. Nandiga Gopalakrishna, M. Fule, Z. Filus, B. Nagyilles, Z. Diveki, T. Grósz, M. Dumergue, P. Jójárt, I. Seres, Z. Bengery, V. Zuba, Z. Várallyay, B. Major, F. Frassetto, M. Devetta, G.D. Lucarelli, **M. Lucchini**, B. Moio, C. Vozzi, S. Stagira, L. Poletto, M. Nisoli, D. Charalambidis, S. Kahaly, A. Zair, K. Varjú, "Attosecond pulse generation at ELI-ALPS 100 kHz repetition rate beamline", *J. Phys. B: At. Mol. Opt. Phys.* **53**, 154004 (2020).
- [48] G. D. Lucarelli, B. Moio, G. Inzani, N. Fabris, L. Moscardi, F. Frassetto, L. Poletto, M. Nisoli, **M. Lucchini**, "Novel beamline for attosecond transient reflection spectroscopy in a sequential two-foci geometry", *Rev. Sci. Instrum.* **91**, 053002 (2020)
- [47] M. Murari, G. D. Lucarelli, **M. Lucchini**, M. Nisoli, "Robustness of ePIE algorithm for the complete characterization of femtosecond, extreme ultra-violet pulses", *Opt. Express* **28**, 10210–10224 (2020).
- [46] **M. Lucchini**, S. A. Sato, F. Schlaepfer, K. Yabana, L. Gallmann, A. Rubio, U. Keller, "Attosecond timing of the dynamical Franz-Keldysh effect", *J. Phys. Phot.* **2**, 025001 (2020). (special issue Emerging Leaders)

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Book chapters

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- [5] G. Sansone, F. Calegari, **M. Lucchini**, M. Nisoli, “*Attosecond Dynamics in Atoms*”, Attosecond and XUV Spectroscopy: Ultrafast Dynamics and Spectroscopy, ed. by: M. J. J. Vrakking and T. Schultz, [Chap. 12, pp. 361-394 \(WILEY-VCH, Weinheim, 2013\)](#). ISBN: 978-3-527-41124-5.
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PhD thesis

- [1] M. Lucchini, “*Molecular dynamics imaging by attosecond pulses*”, PhD thesis, [POLITesi, Tesi di Dottorato \(Politecnico di Milano, Milano, 2012\)](#)

List of conference contributions

Invited talks

Presented personally

- [33] M. Lucchini, *"Ultrafast injection dynamics in Germanium"*, workshop on X-ray spectroscopy and related phenomena (December 4-6 2023, Palermo, Italy).
- [32] M. Lucchini, *"Validity of the Floquet theory with few-fs pulses"*, CMD30 - FisMat joint conference (September 4-8 2023, Milano, Italy).
- [31] M. Lucchini, *"Few-fs Limit Of The Floquet Theory"*, XVI Iberian Joint Meeting on Atomic and Molecular Physics (IBER 2022) (September 21-23 2022, Málaga, Spain).
- [30] M. Lucchini, S. A. Sato, G. D. Lucarelli, B. Moio, G. Inzani, R. Borrego-Varillas, F. Frassetto, L. Poletto, H. Huebener, U. De Giovannini, A. Rubio, M. Nisoli, *"Attosecond non-equilibrium effects in dielectrics"*, 25th congress of the international commission for optics (ICO-25) (September 5-9 2022, Dresden, Germany).
- [29] M. Lucchini, *"Attosecond core exciton dynamics in wide-gap insulators"*, 8th International Conference on Attosecond Science and Technologies (ATTO2022) (July 11-15 2022 in Orlando, USA).
- [28] M. Lucchini *"Dual nature of the exciton quasi-particle revealed by attosecond spectroscopy"*, OSA nonlinear optics topical meeting (August 9-13 2021, web conference because of COVID-19).
- [27] M. Lucchini, *"Attosecond core-exciton dynamics in MgF₂"*, 17^{ème} Journées de la Matière Condensée 17 (JMC17), Perspectives in XUV and attosecond science in condensed matter (August 27 2021, online because of COVID).
- [26] M. Lucchini *"Dual nature of the exciton quasi-particle revealed by attosecond spectroscopy"*, OSA nonlinear optics topical meeting (August 9-13 2021, web conference because of COVID-19).
- [25] M. Lucchini, S. A. Sato, G. D. Lucarelli, B. Moio, G. Inzani, R. Borrego-Varillas, F. Frassetto, L. Poletto, H. Huebener, U. De Giovannini, A. Rubio, M. Nisoli, *"Attosecond Dual Nature of Core Excitons"*, Conference on lasers and electro-optics - European quantum electronics conference (CLEO / EUROPE) (June 20-24 2021, web conference because of COVID-19).
- [24] M. Lucchini, S. A. Sato, G. D. Lucarelli, B. Moio, G. Inzani, R. Borrego-Varillas, F. Frassetto, L. Poletto, H. Huebener, U. De Giovannini, A. Rubio, M. Nisoli, *"Attosecond Dynamical Franz-Keldysh Effect In Core Excitons"*, the 22nd International Conference on Ultrafast Phenomena (UP2020) (November 16-20 2020, web conference because of COVID-19).
- [23] M. Lucchini, R. Borrego-Varillas, G. D. Lucarelli, M. Murari, F. Daniele, F. Frassetto, L. Poletto, M. Nisoli, *"Few-fs Harmonic Radiation for Molecular Spectroscopy"*, Virtual Annual Workshop f AttoChem COST Action (9 – 11 September 2020).
- [22] M. Lucchini, S.A. Sato, J. Herrmann, A. Ludwig, M. Volkov, L. Kasmi, Y. Shinohara, K. Yabana, L. Gallmann, U. Keller, *"Attosecond time-resolved dynamical Franz-Keldysh effect in polycrystalline diamond"*, ICEL 2017 - International Conference on Extreme Light (ICEL2017) (November 6-9 2017 in Szeged, Hungary).
- [21] M. Lucchini, S.A. Sato, J. Herrmann, A. Ludwig, M. Volkov, L. Kasmi, Y. Shinohara, K. Yabana, L. Gallmann, U. Keller, *"Attosecond Dynamical Franz-Keldysh Effect in Polycrystalline Diamond"*, 6th International Conference on Attosecond Physics (ATTO2017) (July 2-7 2017 in Xi'an, China).
- [20] M. Lucchini, S.A. Sato, J. Herrmann, A. Ludwig, M. Volkov, L. Kasmi, Y. Shinohara, K. Yabana, L. Gallmann, U. Keller, *"Time-resolved attosecond dynamical Franz-Keldysh effect"*, 14th International Conference on Multiphoton Processes (ICOMP14) (September 24-27 2017 in Budapest, Hungary).
- [19] M. Lucchini *"Attosecond Dynamical Franz-Keldysh Effect"*, international workshop on Atomic Physics (atom16) (27 November - 2 December 2016 Dresden, Germany).
- [18] M. Lucchini, L. Kasmi, R. Locher L. Castiglioni, M. Greif, L. Gallmann, J. Osterwalder, M. Hengsberger, U. Keller, *"Accessing Energy-Dependent Absolute Photoemission Delays in Solids"*, 13th International Symposium on Ultrafast Intense Laser Science (ISUILS12) (October 5-10 2014, Jodhpur, Rajasthan, India).
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- [14] G. Inzani, S. A. Sato, G. D. Lucarelli, B. Moio, R. Borrego-Varillas, F. Frassetto, L. Poletto, H. Hübener, U. De Giovannini, A. Rubio, M. Nisoli, M. Lucchini, *"Attosecond dynamics of core excitons"*, SPIE Photonics Europe (April 3-7, 2022, Strasbourg, France).
- [13] Ursula Keller, F. Schlaepfer, M. Volkov, S.A. Sato, M. Lucchini, L. Gallmann, A. Rubio, *"New Physical Insight Gained in Condensed Matter with Attosecond transient absorption spectroscopy"*, Ultrafast Phenomena XXI (UP2018) (July 15-20, 2018, Hamburg, Germany).
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- [1] M. Lucchini, F. Ferrari, F. Calegari, C. Vozzi, S. Stagira, G. Sansone, M. Nisoli, *"High-energy isolated attosecond pulses"*, Ultrafast Phenomena XVII (July 18-23, 2010, Snowmass Village, CO, USA).

Oral contributions

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- [61] M. Lucchini, L. Castiglioni, L. Kasmi, P. Kliuiev, A. Ludwig, M. Greif, M. Hengsberger, J. Osterwalder, L. Gallmann, U. Keller, “*Photoemission Time Delays from a Cu(111)-Surface: Validity of Macroscopic Laws for Probe-Field Effects*”, The Conference on Lasers and Electro-Optics/International Quantum Electronics Conference (CLEO:2016) (June 5-10, 2016, San Jose, California, USA).
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- [59] M. Lucchini, T. Zimmermann, A. Ludwig, L. Kasmi, J. Herrmann, A. Landsman, L. Gallmann, U. Keller, “*Time-resolved Study of Helium Excited States with Attosecond Quantum-Beat Spectroscopy*”, Conference on lasers and electro-optics - European quantum electronics conference (CLEO / EUROPE) (June 21-25 2015, Munich, Germany).
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- [55] F. Calegari, F. Ferrari, M. Lucchini, C. Vozzi, G. Sansone, S. Stagira, M. Nisoli. “*Sub-cycle ionization dynamics for the generation of tunable XUV radiation and isolated attosecond pulses*”, FOTONICA 2011 (May 9-11 2011, Genova, Italy).
- [54] M. Lucchini, F. Ferrari, F. Calegari, C. Vozzi, S. Stagira, G. Sansone, M. Nisoli, “*Generation of high-energy isolated attosecond pulses*”, 31st European Conference on Laser (XXXI ECLIM) (September 6-10, 2010, Budapest, Hungary).

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- [53] G.L. Dolso, N. Di Palo, G. Inzani, R. Borrego-Varillas, M. Nisoli, M. Lucchini, “*Attosecond field-driven photoinjection in germanium*”, CMD30 - FisMat joint conference (September 4-8 2023, Milano, Italy).
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