



Part A. PERSONAL INFORMATION			CV date	9/05/2023
First and Family name	Luis Plaja Rustein	Gender	Male	
Social Security, Passport, ID number		Birth date		
e-mail	lplaja@usal.es	URL	laser.usal.es	
Open Researcher and Contributor ID	Researcher ID	K-8701-2014		
	ORCID code	0000-0001-8709-7295		

### A.1. Current position

Current position	Catedrático de Universidad (Full Professor)		
Initial date	28/12/2017		
Institution	Universidad de Salamanca		
Department	Departamento de Física Aplicada		
Address and Country	Pl. de la Merced s/n 37008 Salamanca (Spain)	Teleph. number	
UNESCO code	220913 – Non-linear optics		
Key words	Intense lasers, ultrashort pulses, non-linear optics, harmonics, attosecond		

### A.3. Education

Degree/PhD	University	Year
Licenciado en Física (Graduate in Physics)	Universitat Autònoma de Barcelona	1988
PhD in Physics (Doctor en ciencias físicas)	Universitat Autònoma de Barcelona	1993

## Part B. CV SUMMARY

RESEARCH ACTIVITY: Luis Plaja (LP) graduated in Physics at the Universitat Autònoma de Barcelona (UAB), he made his early research in microelectronics, device modeling, at the Philips Research Labs. (Eindhoven, Netherlands), as a predoctoral fellow and then as FPI fellow. On his return to the UAB, he switched to the field of non-linear optics and intense ultrashort pulse lasers. In 1993, LP obtained the PhD degree in Physics, under the supervision of Prof. Luis Roso. He had a first postdoctoral position with Prof. Luis Roso at the University of Salamanca (USAL). In 1999 he was granted for a second postdoc with Prof. F.H.M Faisal (Universität Bielefeld), one of the founders of the Strong Field Approximation, basis of the current theoretical developments on intense laser-matter interaction. After his stay in Germany he joined USAL as Associate Professor. In Feb. 2015 he was Visiting Fellow at the Joint Institute of Laboratory Astrophysics (JILA, University of Colorado). Presently, he is Full Professor in the Department of Applied Physics at Universidad de Salamanca.

LP is principal investigator of the Research Group on Applications of Lasers and Photonics (ALF) at USAL. The ALF group has obtained the mention of Consolidated Research Unit (UIC016) since 2015 by the Junta de Castilla y León, a degree of excellence that implies high production in publications, obtaining projects and research contracts. The group articulates its activities around the phenomenology associated with ultrashort pulse lasers (characterization, non-linear propagation, generation of harmonics, compression of pulses). LP has led the theoretical investigations in generation of harmonics and attosecond pulses, in particular, the development of new strategies for the calculation of the generation and propagation of high order harmonics. As a result, the ALF is a pioneer in the theoretical description and simulation of these processes. LP's works is published in the highest impact parameter journals (Science, Nat. Photonics, Phys Rev Lett, PNAS, Science Advances). During the last 5 years LP has collaborated with numerous theoretical and experimental groups (JILA, Uni. Hannover, Imperial College, Vienna Technology University, Univ. Cornell, UAB, Argonne Nat. Labs). LP



has been PI in 11 research projects (5 regional, 5 national, 2 European) and two national networks.

**TRAINING AND MANAGEMENT:** LP has directed/co-directed 7 doctoral theses, four of them awarded with the outstanding mention "Premio Extraordinario" and >10 undergraduate and graduate research initiation projects. LP has obtained the mention of "excellent performance in teaching" in the call of the Docentia Program. He has been promoter and director of the master program in Physics and Technology of Lasers at University of Salamanca. He is currently coordinator of the Doctorate Program in Applied Physics and Technology (dFaTech). LP is currently President of the Spanish Society of Optics (SEDOPTICA).

**RESEARCH SIX-YEAR PERIODES (SEXENIOS DE INVESTIGACIÓN):** 5

**DATE OF THE LAST SIX-YEAR PERIOD:** 01/01/2020

**NUMBER OF DOCTORAL THESIS:** completed 7, ongoing 3

**ARTICLES WITH CITATION DATA:** 236 (SCOPUS) , 237 (Google Scholar)

**SUM OF THE TIMES CITED:** 4629 (SCOPUS), 6047 (Google Scholar)

**h-INDEX:** 30 (SCOPUS), 34 (Google Scholar)

## Part C. RELEVANT MERITS

### C.1. Relevant publications in the recent ten years (from 2012)

**PAPER:** L. Rego, *et al*, "Generation of extreme-ultraviolet beams with time-varying orbital angular momentum", **Science** **364**, eaaw9486 (2019)

**IMPACT FACTOR (2019):** 41.846 , **CITATIONS:** 141 (SCOPUS) 161 (Google Scholar), . Author's position 13/17

**PAPER:** O. Zurrón-Cifuentes, Roberto Boyero-García, C. Hernández-García, A. Picón, **L. Plaja**, "Optical anisotropy of non-perturbative high-order harmonic generation in gapless graphene", **Optics Express** **27**, 7776 (2019)

**IMPACT FACTOR (2019):** 3.669 , **CITATIONS:** 30 (SCOP) 31 (Google Scholar).

**PAPER:** K. M Dorney, *et al*, "Controlling the polarization and vortex charge of attosecond high-harmonic beams via simultaneous spin-orbit momentum conservation", **Nature Photonics** **13**, 123 (2019)

**IMPACT FACTOR (2019):** 31.241 , **CITATIONS:** 102 (SCOP) 111 (Google Scholar). Author's position 12/15

**PAPER:** P-C Huang, *et al*, "Polarization control of isolated high-harmonic pulses", **Nat Photonics** **12**, 349 (2018).

**IMPACT FACTOR (2017):** 37.852 , **CITATIONS:** 119 (SCOP) 117 (Google Scholar). Author's position 17/13

**PAPER:** O Zurrón, A Picón, **L. Plaja** "Theory of high-order harmonic generation for gapless graphene", **New Journal of Physics** **20**, 053033 (2018)

**IMPACT FACTOR (2017):** 3.579 , **CITATIONS:** 33 (SCOP) 38 (Google Scholar).

**PAPER:** D Popmintchev, *et al* "Ultraviolet Surprise: Efficient Soft X-Ray High Harmonic Generation in Multiply-Ionized Plasmas", **Science** **350**, 1225 (2015).

**IMPACT FACTOR (2015):** 34.611, **CITATIONS:** 153 (SCOP) 171 (Google Scholar). Author's position 22/19

**PAPER:** M-C Chen, *et al*, "Generation of bright isolated attosecond soft X-ray pulses driven by multicycle midinfrared lasers", Proceedings of the National Academy of Sciences **PNAS** **111**, E2361–E2367 (2014)

**IMPACT FACTOR (2014):** 9.674, **CITATIONS:** 125 (SCOP) 163 (Google Scholar). Author's position 14/8

**BOOK:** **L Plaja**, R Torres and A Zair , "Attosecond Physics. Attosecond Measurements and Control of Physical Systems" **Springer Series in Optical Sciences** **177 (Springer-Verlag Berlin Heidelberg, 2013) ISBN: 978-3-642-37623-8**



ACCESSES: 37000

**PAPER:** C Hernández García, A. Picón, J. San Román, L. Plaja, " Attosecond extreme ultraviolet vortices from high-order harmonic generation", **Phys. Rev. Lett.** **111**, 083602 (2013) IMPACT FACTOR (2013): 7.728, CITATIONS: CITATIONS: 155 (SCOP) 174 (Google Scholar)

**PAPER:** C. Hernández-García, J. A. Pérez-Hernández, T. Popmintchev, M.M. Murnane, H.C. Kapteyn, A. Jaron-Becker, A. Becker, and L. Plaja "Zeptosecond High Harmonic keV X-Ray Waveforms Driven by Midinfrared Laser Physics", **Phys. Rev. Lett.** **111**, 033002 (2013) IMPACT FACTOR (2013): 7.728, CITATIONS: CITATIONS: 125 (SCOP) 157 (Google Scholar)

**PAPER:** T. Popmintchev, *et al* "Bright Coherent Ultrahigh Harmonics in the keV X-Ray Regime from Mid-Infrared Femtosecond Lasers", **Science** **336**, 1287 (2012).

IMPACT FACTOR (2012): 31.027, CITATIONS: CITATIONS: 1502 (SCOP) 1743 (Google Scholar). Author's position 20/16

### C.2 Selection of oral contributions given by the CV's owner (from 2012):

"Symmetry matters!: High-order harmonic generation from low-dimensional crystals driven by structured light", USTS2022, Málaga, November 16-18 2022 (**Invited**)

"A touch of symmetry: High-harmonic generation from low-dimensional crystals.", AOP2022, Gimar.es, July 18-22 2022 (**Keynote**)

"Boost in translation: Structuring high-frequency light using high-harmonic sources", EOS Annual Meeting (EOSAM) 2020 (**Plenary**)

"Unconventional scenarios for high-order harmonic generation", III International Conference on Applications of Optics and Photonics, AOP2017, Faro (Portugal) May 8-12, 2017 (**Keynote**)

"Attosecond Helical Beams from High-Order Harmonic Generation", CHILI2016, Tel Aviv, Israel, 23/2/1026 (**regular**)

"Sculpting the tools for attoscience: Modelling the generation of attosecond pulses", Illuminating 2015, ICMAT, Madrid 7/5/2015 (**Invited**)

"10<sup>18</sup>: Nature in a trillion of a second", LA3NET ITN school, Salamanca, 30/09/2014 (**Invited**)

"Vortices of attosecond XUV radiation from high-order harmonic generation", Laser Physics 2013, Praga, República Checa 15/07/2013 (**Invited**)

"A la caza del gato de Schrödinger", Encuentro sobre fronteras de la Ciencia: Tiempo de física, Salamanca (España), Enero 2013 (**Invited**)

"Sub-attosecond temporal structure of ultra high-order harmonic generation in the keV regime driven by mid-infrared lasers", Laser Physics 2012, Calgary, Canada. 23/07/2012 (**Invited**)

### C.3. Relevant research projects as PI in the recent ten years (from 2012)

**REFERENCE:** PID2019-106910GB-I00

**TITLE:** Generación, control y aplicaciones de los pulsos ultracortos de alta frecuencia.

**FUNDING AGENCY:** Agencia Estatal de Investigación (Ministerio de Ciencia e Innovación)

**PRINCIPAL INVESTIGATORS:** Julio San Román, Luis Plaja (Universidad de Salamanca)

**CALL:** Convocatoria 2019 de «Proyectos de I+D+i» de los Programas Estatales de Generación de Conocimiento y Fortalecimiento Científico y Tecnológico del Sistema de I+D+i y de I+D+i Orientada a los Retos de la Sociedad.

**EXTENSION:** 01/06/2020- 31/05/2023 **FUNDING:** 82.280,00 €

**REFERENCE:** EQC2018-004117-P

**TITLE:** Instalación y explotación de un sistema CPA-OPA como base del laboratorio de fotónica y espectroscopia resuelta en el tiempo.

**FUNDING AGENCY:** Ministerio de Ciencia, Innovación y Universidades, Univ. de Salamanca



**PRINCIPAL INVESTIGATOR:** Luis Plaja

**CALL:** Ayudas para la adquisición de equipamiento científico-técnico correspondientes al subprograma estatal de infraestructuras de investigación y equipamiento científico-técnico (plan estatal i+d+i 2017-2020) **EXTENSION:** 01/01/ 2019- 31/12/2019.

**FUNDING:** 439,814.01€ (de los cuales 219,907.00€ Ministerio-FEDER y 219,907.01 USAL)

**REFERENCE:** FIS2016-75652-P

**TITLE:** Nuevos escenarios de la óptica de pulsos de femto y attosegundos.

**FUNDING AGENCY:** MINECO

**PRINCIPAL INVESTIGATORS:** Luis Plaja, Julio San Román (Universidad de Salamanca)

**CALL:** Convocatoria 2016 del Programa Proyectos I+D de Investigación Científica y Técnica de Excelencia Subprograma Estatal de Generación de Conocimiento **EXTENSION:** 1/2017-12/2020 **FUNDING:** 95.000,00€.

**REFERENCE:** FIS2015-71933-REDT

**TITLE:** Red Temática para el Control y Caracterización de Luz Láser

**FUNDING AGENCY:** MINECO

**PRINCIPAL INVESTIGATOR:** Luis Plaja (Universidad de Salamanca)

**CALL:** Convocatoria 2015 de las Acciones de dinamización "Redes de Excelencia", del Programa Estatal de Investigación Científica y Técnica de Excelencia. **EXTENSION:** 01/12/2015- 30/11/2017 **FUNDING:** 30.000,00 €.

**REFERENCE:** H2020-MSCA-IF-2015/H2020-MSCA-IF-2015-702565

**TITLE:** HHGhole2: High-harmonic spectroscopy for core-hole dynamics

**FUNDING AGENCY:** European Commission

**PRINCIPAL INVESTIGATOR:** Luis Plaja (Universidad de Salamanca)

**CALL:** Marie Skłodowska-Curie Individual Fellowships (IF-EF)

**EXTENSION:** 12/2016-12/2018 **FUNDING:** 158,121.60€.

**REFERENCE:** FIS2013-44174-P

**TITLE:** Fronteras de la Óptica Ultrarrápida: Ciencia y Aplicaciones de los Pulsos de Femto y Attosegundo.

**FUNDING AGENCY:** MINECO

**PRINCIPAL INVESTIGATORS:** Luis Plaja, Pablo Moreno (Universidad de Salamanca)

**CALL:** Programa Fomento Investigación Científica y Técnica de Excelencia 2013

**EXTENSION:** 01/01/2014-01/09/2017 **FUNDING:** 100.000,00 €.

**REFERENCE:** PIOF-A-2012-328334

**TITLE:** X-HARM New Frontiers for Coherent X-Ray Generation

**FUNDING AGENCY:** European Commission

**PRINCIPAL INVESTIGATORS:** Luis Plaja (Universidad de Salamanca), Andreas Becker (Universidad de Colorado, USA)

**CALL:** Marie Skłodowska-Curie Individual Fellowships (IOF)

**EXTENSION:** 06/2013-05/2016 **FUNDING:** 254.926,00 €

#### C.4. Relevant contracts

**TITLE:** Tabletop Coherent X-ray Nano-bio Imaging at the Space-time Limits (NANO-X)

**CONTRACTING PARTY:** University of Colorado at Boulder (USA)

**PRINCIPAL INVESTIGATOR:** Carlos Hernández-García

**CONTRACT TYPE:** Art. 83 **EXTENSION:** 29/11/2016-11/04/2018 **FUNDING:** 22,500€

#### C.6 Other relevant merits:

President of the Spanish Society of Optics (SEDOPTICA): From April 2023 to present