MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

CV date	25-01-2023

First name	Agustín Joel		
Family name	Villatoro		
Gender (*)	Male	Birth date (dd/mm/yyyy)	28/08/1968
Social Security, Passport, ID number	79438109L		
e-mail	agustinjoel.villatoro@ehu.eus	Google Scholar	
Open Researcher and Contributor ID (ORCID) (*)		**0000-0002-0842-9173**	

(*) Mandatory

A.1. Current position

Position	**Ikerbasque Research Professor**		
Initial date	13/Jun/2013		
Institution	Universidad del País Vasco UPV/EHU		
Department/Center	Ing. Comunicaciones	Escuela de Ingeniería de Bilbao	
Country	Spain	Teleph. number	946017277
Key words	Multicore fiber sensors, optical fiber mode interferometers, biosensors, multi-parameter sensors, plasmonic sensors, interferometric sensors.		

A.2. Previous positions (research activity interuptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
From January 2006 to August 2012	**Ramon y Cajal Researcher**. ICFO -Institute of Photonic Sciences, Barcelona, Spain.
From November 2001 to November 2005	**Investigador Titular**: CIO (Centro de Investigaciones en Óptica A. C.) León GTO, Mexico.

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD Degree	Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico	1999
Master Degree	Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico	1995

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

I am author of +**86 journal publications** (being **leader** or corresponding author in 85% of them), 65 conference proceedings, and **6 granted patents.** To date, I have +**5900 citations** and h-factor of 43. I have supervised 2 undergraduate, 2 master, and 6 PhD students and 2 postdoctoral researchers. I have been the **PI of several research projects** financed by Basque, Spanish, or European agencies; and of two industrial contracts. I have collaborated with researchers of five different countries. I am **Associate Editor** in three scientific Journals.

Part C. RELEVANT MERITS *(sorted by typology)*

In 2020, I was awarded the distinction of ***OPTICA Fellow*** for my contributions to interferometric optical fiber sensors. In 2021 and 2022, I was included in the prestigious list of the **"World´s Top 2% Scientists"** published by Stanford University and Scopus. I have 20 publications with more than 100 citations each. All the aforementioned suggests the strong impact of my publications, my capability to generate **high-quality research**, and my contributions to expand the frontiers of my research field. I have given 2 tutorials and around 26 invited talks at international events. For my contributions, I was invited to be Associate Editor in *Journal of Lightwave Technology* and *Sensors and Actuators Reports*. I am Chief Specialty Editor in *Frontiers in Sensors*; and I belong to the Editorial Advisory Committee of *Optics & Photonics News*. I have worked for Aston University (UK), ICFO (Spain), Centro de Investigaciones en Óptica A.C. (Mexico), and Case Western Reserve University (USA).

C.1. Publications *(see instructions)*

1. C. Caucheteur, J. Villatoro, F. Liu, M. Loyez, T. Guo, J. Albert, "Mode-division and spatial-division optical fiber sensors," *Advances in Optics and Photonics* (IF: **24.750**) 14, 1-86 (2022).
2. J.A. Flores-Bravo, J. Madrigal, J. Zubia, S. Sales, J. Villatoro, "Coupled-core fiber Bragg gratings for low-cost sensing," *Scientific Reports* (IF: **4.996**) 12, 1280 (2022)
3. J. A. Flores-Bravo, R. Fernandez, J. E. Antonio-Lopez, J. Zubia, A. Schulzgen, R. Amezcua-Correa, J. Villatoro, "Simultaneous sensing of refractive index and temperature with a supermode interferometer," *Journal of Lightwave Technology* (IF: **4.439**) 39, 7351-7357 (2021).
4. A. Ortega-Gomez, M. Loyez, M. Lobry, K. Chah, J. Zubia, J. Villatoro, C. Caucheteur, "Plasmonic sensors based on tilted Bragg gratings in multicore optical fibers," *Optics Express* 29, 18469-18480 (2021).
5. M. C Alonso-Murias, D. Monzón-Hernández, O. Rodríguez-Quiroz, J. E. Antonio-Lopez, A. Schülzgen, R. Amezcua-Correa, J. Villatoro, "Long-range multicore optical fiber displacement sensor," *Optics Letters* 46, 2224-2227 (2021).
6. J. Amorebieta, A. Ortega-Gomez, G. Durana, R. Fernández, E. Antonio-Lopez, A. Schülzgen, J. Zubia, R. Amezcua-Correa J. Villatoro, "Compact omnidirectional multicore fiber-based vector bending sensor," *Scientific Reports* (IF: **4. 996**) 11, 1-11 (2021).
7. M. C. Alonso-Murias, D. Monzón-Hernández, O. Rodríguez-Quiroz, J. E. Antonio-Lopez, A. Schülzgen, R. Amezcua-Correa, J. Villatoro, "Long-range multicore optical fiber displacement sensor," *Optics Letters* 46, 2224-2227 (2021).
8. A. Ortega-Gomez, J. Barroso, A. Calatayud-Sánchez, J. Zubia, F. Benito-Lopez, L. Basabe-Desmonts, J. Villatoro, "Cytochrome c detection by plasmonic nanospectroscopy on optical fiber facets," *Sensors and Actuators B: Chemical* (IF: **9.221**) 330, Art. No. 129358 (2021).
9. J. Amorebieta, A. Ortega-Gomez, G. Durana, R. Fernández, E. Antonio-Lopez, A. Schülzgen, J. Zubia, R. Amezcua-Correa, J. Villatoro, "Highly sensitive multicore fiber accelerometer for low frequency vibration sensing," *Scientific Reports* 10, Art. No. 16180 (2020).
10. J. Villatoro, J. Amorebieta, A. Ortega-Gomez, E. Antonio-Lopez, J. Zubia, A. Schülzgen, R. Amezcua-Correa, "Composed multicore fiber structure for direction-sensitive curvature monitoring," *APL Photonics* (IF: **6.382**) 5, Art. No. 070801 (2020). ***Invited paper***.
11. J. Barroso, A. Ortega-Gomez, A. Calatayud-Sanchez, J. Zubia, F. Benito-Lopez, J. Villatoro, L. Basabe-Desmonts, "Selective ultrasensitive optical fiber nanosensors based on plasmon resonance energy transfer," *ACS Sensors* (IF: **9.618**) 5, 2018–2024 (2020).
12. J. Villatoro, Phase-shifted modal interferometers for high-accuracy optical fiber sensing, *Optics Letters* 45, 21-24 (2020).
13. O. Arrizabalaga, J. Velasco, J. Zubia, I. Sáez de Ocáriz, J. Villatoro, "Miniature interferometric humidity sensor based on an off-center polymer cap onto optical fiber facet," *Sensors and Actuators B: Chemical* (IF: **9.221**) 297, Art. No. 126700 (2019).
14. J. Amorebieta, G. Durana, A. Ortega-Gomez, R. Fernandez, J. Velasco, I. Saez de Ocariz, J. Zubia, J. E. Antonio-Lopez, A. Schulzgen, R. Amezcua-Correa, J. Villatoro, "Packaged multi-core fiber interferometer for high temperature sensing," *Journal of Lightwave Technology* 37, 2328-2334 (2019).

15. O. Arrizabalaga, J. Zubia, J. Villatoro, Microrefractometer based on off-center polymer caps bonded onto optical fiber tips, *Journal of Lightwave Technology* 36, 3573-3579 (2018).
16. O. Arrizabalaga, G. Durana, J. Zubia, J. Villatoro, "Accurate microthermometer based on off center polymer caps on optical fiber tips," *Sensors and Actuators B: Chemical*, 272, 612-617 (2018).
17. J. Villatoro, E. Antonio-Lopez, J. Zubia, A. Schülzgen, R. Amezcua-Correa, "Interferometer based on strongly coupled multi-core optical fiber for accurate vibration sensing," *Optics Express* 25, 25734-25740 (2017).
18. J. Villatoro, O. Arrizabalaga, G. Durana, I. Sáez de Ocáriz, E. Antonio-Lopez, J. Zubia, A. Schülzgen, R. Amezcua-Correa, "Accurate strain sensing based on super-mode interference in strongly coupled multi-core optical fibres," *Scientific Reports* 7, 4451 (2017).
19. D. Lopez-Torres, C. Elosua, J. Villatoro, J. Zubia, M. Rothhardt, K. Schuster, F. J. Arregui, "Enhancing sensitivity of photonic crystal fiber interferometric humidity sensor by the thickness of SnO2 thin films," *Sensors and Actuators B: Chemical* 251, 1059-1067 (2017).
20. J. Villatoro, E. Antonio-Lopez, A. Schülzgen, R. Amezcua-Correa, "Miniature multicore optical fiber vibration sensor," *Optics Letters*, 42, 2022-2025 (2017).
21. D. Lopez-Torres, C. Elosua, J. Villatoro, J. Zubia, M. Rothhardt, K. Schuster, F. J. Arregui, "Photonic crystal fiber interferometer coated with a PAH/PAA nanolayer as humidity sensor," *Sensors and Actuators B: Chemical*, 242, 1065–1072 (2017).
22. I. Hernández-Romano, M. A Cruz-Garcia, C. Moreno-Hernández, D. Monzón-Hernández, E. O. López-Figueroa, O. E. Paredes-Gallardo, M. Torres-Cisneros, J. Villatoro, "Optical fiber temperature sensor based on a microcavity with polymer overlay," *Optics Express* 24, 5654-5661 (2016).
23. J. Villatoro, A. Van Newkirk, J. Antonio-Lopez, J. Zubia, A. Schulzgen, R. Amezcua Correa, "Ultrasensitive vector bending sensor based on multicore optical fiber," *Optics Letters*, 41, 832-835 (2016).

C.2. Congress

1. J. Villatoro, "Optical Sensing with Specialty Fibers." Invited **tutorial** at *OFC Conference & Exhibition*. San Diego, CA, USA, March 2023.
2. J. Villatoro, "Fiber optic interferometric sensors." Invited **tutorial** at 27th *International Conference on Optical Fiber Sensors*. Alexandria, USA, August 2022.
3. J. Villatoro, "Coupled-core optical fiber sensing." **Invited talk** at *Advanced Photonics Congress*. Maastricht, Netherlands, July 2022.
4. J. Villatoro, "Sensores interferometricos y plasmónicos de fibra óptica" *Virtual Plenary Talk* at the Conference SPIE-OPUMA 2021. 24-Nov-2021.
5. J. Villatoro, "Optical fiber interferometers for precision sensing," *Plenary Talk*. 19th ISOT-International Symposium on Optomechatronic Technology. Cancun, Mexico. Conference. 5-8 Noviembre de 2018.
6. A. Calatayud-Sanchez, R. Catalan-Carrio, A. Ortega, J. Barroso-Lázaro, J. Zubia, F. Benito Lopez, J. Villatoro, L. Basabe "Plasmon resonance energy-transfer-based fiber-optic platform for ultrasensitive sensing", *Invited Talk* at Phtonics West (SPIE OPTO) Smart Photonic and Optoelectronic Integrated Circuits XXIII, 5 March 2021.
7. R. Amezcua-Correa, E. Antonio-Lopez, O. Arrizabalaga, J. Zubia, A. Schülzgen, J. Villatoro, "Multicore Optical Fiber Sensors," *Invited Talk*. CLEO/Pacific Rim 2018. Paper W4L.2. Hong Kong, China. 29 July–3 August 2018.
8. A. Schülzgen, A. Van Newkirk, J. E. Antonio-Lopez, R. Amezcua-Correa, J. Zubia, J. Villatoro, "Fiber optic sensors based on strongly coupled multicore fiber." *Invited Talk*. OSA Advanced Photonics Congress. Paper SeW1E.1. New Orleans, Louisiana, United States. 24-27 July 2017.
9. J. Villatoro, O. Arrizabalaga, J. E. Antonio-Lopez, J. Zubia, I. Saez de Ocariz, "Multicore fiber sensors," *Invited Talk* at Optical Fiber Communication Conference (OFC), paper Th3H.1. Los Angeles, CA, USA. March 19-23, 2017.

10. R. Amezcua-Correa, A. Schulzgen, A.Van Newkirk, J. E. Antonio-Lopez, Z. S. Eznaveh, J. Villatoro, "Multicore optical fiber and their applications." *Invited Talk*. OSA Advanced Photonics Congress. Paper SoM2F.5. Vancouver Canada. 18-20 July 2016.
11. J. Villatoro, E. Antonio-Lopez, A. Van Newkirk, J. Zubia, A. Schülzgen, R. Amezcua-Correa, "Supersensitive sensors based on multicore optical fibres," *Invited Talk*, SPIE Photonics Europe. Proc. SPIE 9886 art. no. 98860E. Brussels, Belgium, April 3-7, 2016.
12. J. Zubia, M.A. Illarramendi, J. Villatoro, G. Durana, G. Aldabadetreku, "Plastic optical fiber for sensing applications," *Invited Talk*, BIT 2nd Annual World Congress of Smart Materials, Singapore, March 4-6, 2016.
13. D. Monzón-Hernández, C. Moreno-Hernández,I. Hernández-Romano, J. Villatoro, "All-optical microfiber interferometer sensors," *Invited Talk*, Mexican Optics and Photonics Meeting, September 9-11, 2015.
14. J. Villatoro, V. P. Minkovich, J. Zubia, "Photonic crystal fiber mode interferometers as multi-sensors," *Invited Talk*, 20th IMEKO TC-4 International Symposium, Benevento, Italy, September 15-17, 2014.
15. J.A. Flores-Bravo, J. Zubia, J. Villatoro, "Photonic lantern for multiplexing fiber Fabry-Perot sensors," *Talk* at CLEO/Europe-EQEC Conference, 21-June-2021.

C.3. Research projects

1 **SENQET** "Selective Plasmonic Sensors based on Quantum Electron Transfer" (Marie Skłodowska-Curie Project No. 101065079). Amount granted: 165 313 €. PI: Joel Villatoro. Duration: 1-Mar-2023 to 28-Feb-2025.

2 "**COUPLED-CORE FIBERS**" ACTPHAST4R, Grant Agreement No. 825051, 60 000€. PI: Joel Villatoro and K. Wondraczek. Duration: 01-01-2023 to 31-12-2023.

3 **CORES** "Coupled-core Optical Fiber Sensors" (*Prueba de Concepto* Project No. PDC2022-133885-I00 financed by the Ministerio de Ciencia e Innovación). Duration: 24 months (01-12-2022 to 30-11-2024). Amount granted: 149 500 €. PI: Joel Villatoro

4 **MINAKU** "Multilayer Integrated Advanced Cutaneous Sensing" (Project ELKARTEK22/91 supported by the Basque Government). Amount granted: 797 272 € (38 073 € for the UPV/EHU team). PI: G. Artola Beobide. Duration: 1-07-2022 to 30-06-2024.

5 **DISMOCAN** "Dispositivo optofluídico para la monitorización rápida on-site de niveles de antibióticos en sangre." Project ELKARTEK KK-2021/00025 financed by the Gobierno Vasco. Duration (in months): 24, 27-02-2021 to 31-12-2022. PI: A. M. Zaldua Huici; at the UPV/EHU: Joel Villatoro. Amount granted: 380 000 € (28 000 € for the UPV/EHU team).

6 **MULTISENSE** (PGC2018-101997-B-I00) "Sensores avanzados con fibras multinúcleo" Financed by: MINECO (Ministerio de Economía y Competitividad). Duration (in months): 36, from 01-01-2019 to 30-09-2022. PI: Joel Villatoro. Amount granted: 39 900 €.

7 **RET-GQD** (COFUND-GA-2015-713694) "Resonance energy transfer in graphene-quantum dots systems for nano-photonics" Financed by: Marie Skłodowska-Curie COFUND (MULTIPLY Project). Duration (in months): 24, from 06-06-2018 to 05-06-2020. PI: Joel Villatoro. Amount granted: 122 400 €.

8 **POF-PLUS** (TEC2015-638263-C03-1R) Fabricación de fibras óptica de plástico microestrcuturadas para sensado y comunicaciones. Financed by: MINECO (Ministerio de Economía y Competitividad). Duration (in months): 45, from 1-01-2016 to 30-09-2019. PI: J. Zubia, Joel Villatoro. Amount granted: 275 000 €.

9 **BIOELECTRONIC INTELIGENTE** (Research Contract with Unikare Bioscience S.L.) Amount of the contract: 59 970 €. Duration: 2 years (2022-2023). PI: Joel Villatoro.

C.4. Patents

1. J. Villatoro, J. Madrigal, S. Sales "Coupled-core optical fiber with fiber Bragg grating and sensing device," Application No. 21382402.2, European Patent Office (2021).
2. J. Villatoro, J. A. Flores-Gomez, J. Zubia, "Interferometric optical fiber refractometer," Application No. 20382749.8, European Patent Office (2020).
3. J. Villatoro, J. Zubia "Composed multicore optical fiber interferometer," Application No. EP3757524-A1, European Patent Office (2020).
4. J. Villatoro, V. Pruneri, G. Badenes, "All-optical fibre interferometer." Patent No. EP1939659-B1 granted by the European Patent Office.