

**Part A. PERSONAL INFORMATION**

CV date 03/10/2023

First and Family name	Ahufinger Breto, Verónica		
Social Security, Passport, ID number		Age	
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0002-6628-9930	
	SCOPUS Author ID (*)		
	WoS Researcher ID (*)	F-7049-2014	

(\*) Optional (\*\*) Mandatory

**A.1. Current position**

Name of University/Institution	Universidad Autónoma de Barcelona (UAB)		
Department	Departamento de Física, Facultad de Ciencias		
Address and Country	Campus de la UAB, 08193 Bellaterra		
Phone number		E-mail	<a href="mailto:veronica.ahufinger@uab.cat">veronica.ahufinger@uab.cat</a>
Current position	Full Professor (Catedrática de Universidad)	From	05/05/2023
Key words	Ultracold Atoms, Photonics, Topology, Quantum Transport		

**A.2. Education**

PhD, Licensed, Graduate	University	Year
BSc	Universidad Autónoma de Barcelona	1997
Msc	Universidad Autónoma de Barcelona	1999
PhD	Universidad Autónoma de Barcelona	2002

**A.3. General indicators of quality of scientific production**

Data obtained from the Web of Science™ (All Databases) and the Journal Citation Reports® corresponding to the year of publication.

- Total number of publications: 74 (proceedings not included); first quartile (Q1): 45; first decile (D1): 21; books: 1; book chapters:1.
- Total number of citations: 3457 citations
- h-index:20
- Thesis supervised (in the last 10 years): 6
- International invited oral contributions: 26
- Recognized research periods (Sexenios): 4; 1998-2003, 2004-2009, 2010-2015, 2016-2021
- Recognized teaching periods (Tramos docentes): 4; 1998-2003, 2003-2010, 2011-2015, 2016-2020

**Part B. CV SUMMARY**

Veronica Ahufinger is full professor of the Physics Department at the Universitat Autònoma de Barcelona (UAB) since May 2023. In 1999, she presented the MsC Thesis about lasing without inversion that deserved the maximum mark and the award "Jordi Porta i Jué" of the Catalan Physical Society. In 2002, she defended her PhD in Physics at the UAB (which was awarded with the maximum mark and with the PhD extraordinary award of the UAB) about light-matter interaction and atomic coherence. During her PhD, she did two research stays at the Van der Waals-Zeeman Instituut (Amsterdam) and at the European Laboratory for Non-Linear Spectroscopy (Florence). After finishing the PhD, she moved as a Marie Curie Fellow for two years to the Leibniz Universität, Hannover (Germany). During the post-doctoral period, she started to work in a new research line based on the study of the physics of ultracold atoms in optical lattices. In January 2005, V.A. joined the Physics Department at the UAB. First, with a Juan de la Cierva fellowship and from November 2005 to November 2010 she was ICREA junior researcher. During this period, she investigated the generation and the interactions of matter-wave solitons, created in Bose-Einstein condensates, with defects and also the use of ultracold atoms in optical lattices as quantum simulators. In this context, she is coauthor of an extensive review paper in Advances in Physics 2007 that belongs to the "most cited papers" (according with the Journal Citation Report) and deserved the



research excellence award of the UAB (PREI2008). In 2012, V.A. published, together with Prof. M. Lewenstein and Prof. A. Sanpera, a book for Oxford University Press entitled *Ultracold atoms in optical lattices: simulating quantum many body physics*. In the last years, as associate professor at the UAB, she has been working on the quantum transport of matter waves from single atoms to Bose-Einstein condensates to design quantum devices for Atomtronics, in the extension of spatial adiabatic passage to light and sound, in light-matter interaction with applications to quantum memories and atomic localization and in quantum simulation of topological systems. She has 74 peer-reviewed publications with 3457 citations, has supervised 6 PhD Thesis (and is presently supervising 3 more), 9 Master Thesis, 2 projects for research competence and 31 final degree projects (currently 2 more). From January 2011 to April 2014, V. Ahufinger was academic coordinator of the Physics degree and of the double degrees of Physics-Mathematics and Physics-Chemistry of the UAB and from June 2014 to September 2016, she was vice-dean of the Science Faculty of the same university. From July 2016 to July 2018, she was scientific collaborator of the Agència Estatal de Investigació. Since January 2021 she is academic coordinator at the UAB of the Interuniversity Photonics master and the Europhotonics master.

## Part C. RELEVANT MERITS (in the last 10 years)

### C.1. Publications (in the last 10 years)

1. (Article) E. Nicolau, A. M. Marques, J. Mompart, V. Ahufinger and R. G. Dias. Local Hilbert space fragmentation and weak thermalization in Bose-Hubbard diamond necklaces. *Phys. Rev. B* 107, 094312(1)- 094312(9) (2023), (Number of authors=5/Position (V. Ahufinger)=4).
2. (Article) C. Jörg, G. Queraltó, M. Kremer, G. Pelegrí, J. Schulz, A. Szameit, G. von Freymann, J. Mompart and V. Ahufinger. Artificial gauge field switching using orbital angular momentum modes in optical waveguides. *Light Science & applications* 150, **9** (7p) (2020), (9/9).
3. (Article) G. Pelegrí, A. M. Marques, R. G. Dias, A. J. Daley, J. Mompart and V. Ahufinger, Topological edge states and Aharonov-Bohm caging with ultracold atoms carrying orbital angular momentum. *Phys Rev A* **99**, 023613 (6 p) (2019), (6/6).
4. (Article) J. Polo, V. Ahufinger, F. W. J. Hekking, A. Minguzzi. Damping of Josephson oscillations in strongly correlated one-dimensional atomic gases. *Phys. Rev. Lett.* **121**, 090404 (6 p) (2018), (4/2).
5. (Article) A. Turpin, G. Pelegrí, J. Polo, J. Mompart and V. Ahufinger. Engineering of orbital angular momentum supermodes in coupled optical waveguides. *Scientific Reports* **7**, 44057 (9 p) (2017), (5/5).
6. (Review article) R. Menchon-Enrich, A. Benseny, V. Ahufinger, A. D. Greentree, Th. Busch and J. Mompart. Spatial adiabatic passage: a review of recent progress. *Reports on Progress in Physics* **79** 074401 (31 p) (2016), (6/3).
7. (Article) R. Menchon-Enrich, J. Mompart and V. Ahufinger, Spatial adiabatic passage processes in sonic crystals with linear defects, *Phys. Rev. B* **89**, 094304 (10 p) (2014), (3/3).
8. (Article) R. Menchon-Enrich, A. Llobera, J. Vila-Planas, V. J. Cadarso, J. Mompart and V. Ahufinger. Light spectral filter based on adiabatic passage. *Light: Science & Applications* **2** e90, doi: 10.1038/lisa.2013.46 (8 p) (2013), (6/6).
9. (Article) J. Polo and V. Ahufinger. Soliton-based matter wave interferometer. *Physical Review A* **88** 053628 (8 p) (2013), (2/2).
10. (Book) M. Lewenstein, A. Sanpera and V. Ahufinger. Ultracold atoms in optical lattices: simulating quantum many body physics. Oxford University Press, 2012 (ISBN-13: 9780199573127), (3/3).

### C.2. Research projects

In the last 10 years I have participated in 5 research projects being Principal Investigator in 3 of them:

1. Simulación cuántica e ingeniería de modelos topológicos con plataformas atómicas y fotónicas (PID2020-118153GB-I00) Ministerio de Ciencia e Innovación; Universitat Autònoma de Barcelona; 01/09/2021-31/08/2024; 108.000,00€; Participation: Principal Investigator.



2. Dispositivos de ondas de materia y fotónicos para las tecnologías cuánticas (FIS2017-86530-P) Ministerio de Ciencia, Innovación y Universidades; Universitat Autònoma de Barcelona; 01/01/2018-31/12/2020; 92.000,00€; Participation: Principal Investigator.
3. Quantum Technologies with Ultracold atoms, QTech, (COST Action CA16221); European Commission; Participation: Member of the Management Committee and Workgroup leader.
4. Transporte cuántico en potenciales en anillo: desde átomos individuales hasta gases degenerados con interacciones (FIS2014-57460-P); Ministerio de Economía y Competitividad; Universitat Autònoma de Barcelona; 01/01/2015-31/12/2017; 125.000,00 €; Participation: Principal Investigator.
5. Manipulación de ondas de materia en potenciales ópticos (FIS2011-23719); Ministerio de Ciencia e Innovación; Universitat Autònoma de Barcelona; 01/01/2011-31/12/2014; 60.000,00 €; Participation: Investigator. PI: J. Mompart.

### **C.3. Contracts, technological or transfer merits**

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### **C.4. Patents and other IPR**

- V. Ahufinger, J. Mompart, G. Pelegrí, A quantum sensing device, a system comprising the device, and a method for measuring using the device, T-2017-034EP (2018), solicitud (España y Reino Unido). <https://patents.google.com/patent/GB201804204D0/en>

### **C.5, C.6, C.7... Other (in the last 10 years)**

#### **C.5. PhD Theses supervised:**

1. Supersymmetry and topology in coupled optical waveguides, Gerard Queraltó, Universitat Autònoma de Barcelona, 14/09/2020. Supervisors: V. Ahufinger and J. Mompart.
2. Engineering of three-level systems using adiabatic passage, Juan Luis Rubio, Universitat Autònoma de Barcelona, 22/07/2020. Supervisors: V. Ahufinger and J. Mompart.
3. Ultracold atoms carrying orbital angular momentum, Gerard Pelegrí, Universitat Autònoma de Barcelona, 06/03/2020. Supervisors: V. Ahufinger and J. Mompart.
4. Tunneling dynamics of ultracold atoms, Juan Polo, Universitat Autònoma de Barcelona, 1/12/2016. Supervisor: V. Ahufinger.
5. Spatial Adiabatic Passage: light, sound and matter waves, Ricard Menchon-Enrich, Universitat Autònoma de Barcelona, 13/12/2013. Supervisors: V. Ahufinger and J. Mompart.
6. From quantum memories to single-site addressing with three-level atoms, Daniel Viscor, Universitat Autònoma de Barcelona, 11/01/2013. Supervisors: V. Ahufinger and J. Mompart.

#### **C.6. Participation in assessment or advisory tasks:**

1. Evaluation expert for the European Commission in 2021 and 2022.
2. Evaluation Committee member of the intake 22-23 of the Europhotonics master.
3. Evaluation Committee member of two positions at UAB, 2021 and 2023.
4. Evaluation Committee member of the ICFO International PhD Program 2020 and 2021 and M.J. Yzuel PhDs, 2020.
5. Evaluation Committee member of a permanent position at IFISC (CSIC), 2020.
6. Reviewer of research projects for the National Science Centre of Poland, 2017 and 2019.
7. From July 2016 to July 2018, scientific collaborator of the Spanish Ministerio de Economía y Competitividad (later Agencia Estatal de Investigación).
8. Reviewer of research projects for young researchers (JIN) for the Spanish Agencia Nacional de Evaluación y Prospectiva (ANEP), 2016.
9. Technical Commission member for the evaluation of research projects of the National Plan of the Spanish Ministerio de Economía y Competitividad, 2015 and 2022.
10. Evaluation Committee member of a permanent position at UPC, 2015.
11. Reviewer of research projects for the Agencia Nacional de Promoción Científica y Tecnológica de Argentina, 2013-2014.
12. Evaluation Committee member for the Juan de la Cierva post-doctoral positions, 2011, 2016, 2017.
13. Member of the Evaluation Committee of 14 PhD, 28 MsC and 66 Degree Theses.

#### **C.7. International Committees:**

1. Organizing Committee member Frontiers of Atomic Physics and Quantum Information workshop, Barcelona, October 2022.
2. Co-director of the ICTP Winter College on Optics: Quantum Photonics and Information, Trieste (Italy), February 2020.



3. Organizing Committee member of the Grenoble-Barcelona twin conference: from quantum systems to new materials and smart electrical energy, Grenoble (France), October 2019.
4. Organizing Committee member of the AtomQT training school, Bellaterra, September 2019.
5. Since August 2018, member of the International Advisory Committee of the International Conference on Atomic Physics, ICAP.
6. Vice-chair of the 26<sup>th</sup> International conference on Atomic Physics ICAP 2018, Barcelona, July 2018
7. Organizing Committee member of the Summer School ICAP2018, Barcelona, July 2018.
8. Since November 2017, Working group leader of the COST Action CA16221: Quantum Technologies with Ultracold atoms, QTech.
9. Organizing Committee member of the I Benasque School on Quantum and Nonlinear Optics, Benasque, Spain, October 2014.

#### **C.8. National Committees:**

1. Co-organizer of the second meeting of the Spanish Cold Atom community, online, October 2020.
2. Scientific Committee member of the Symposium in Quantum and Nonlinear Optics of the "XII Reunión Nacional de Óptica", Castellón, July 2018.
3. Scientific Committee member of the Symposium in Quantum and Nonlinear Optics of the "XXXVI Reunión Biennial de la Real Sociedad Española de Física", Santiago de Compostela 2017.
4. Scientific Committee member of the Symposium in Quantum and Nonlinear Optics of the "XI Reunión Nacional de Óptica", Salamanca, September 2015.
5. Scientific Committee member of the Symposium in Quantum and Nonlinear Optics of the "XXXV Reunión Bienal de la Sociedad Española de Física", Gijón 2015.
6. Scientific Committee member of the Symposium in Quantum and Nonlinear Optics of the "XXXV Reunión Bienal de la Sociedad Española de Física", Valencia 2013.

#### **C.9. Management of scientific activities:**

1. From July 2014 to December 2017, secretary of the Specialized group on Quantum and Nonlinear Optics Committee of the Spanish Royal Society of Physics.
2. From November 2012 to July 2018, secretary of the Quantum and Nonlinear Optics Committee of the Spanish Society of Optics.

#### **C.10. Institutional responsibilities:**

1. Since January 2021: Academic coordinator of the interuniversity BCN Photonics Master and the Europhotonics master.
2. June 2014-September 2016: Vice-dean of the Faculty of Sciences of the UAB.
3. June 2014-September 2016: Secretary of the Academic Issues, Post-graduate studies and Student Exchange Comissions of the Faculty of Sciences of the UAB.
4. December 2012-March 2014: Member of the Commission to review the contents and the structure of the Physics degree of the UAB.
5. January 2011-August 2016: Member of the Faculty of Science Board, UAB.
6. January 2011-April 2014: Academic coordinator of the Physics degree, double degree in Physics and Mathematics and double degree in Physics and Chemistry of the UAB.
7. 2008-2011: Academic coordinator of module of the interuniversity BCN Photonics Master.
8. Since September 2008: Member of the Executive Council of the Physics Department of the UAB.

#### **C11. Teaching Activities:**

- Degree: I have been teaching at the UAB in the Physics and Nanoscience & Nanotechnology degrees: Classical Mechanics and Waves, Quantum Optics, Photonics, Electromagnetism and Optics.
- Master: I have been teaching: Quantum Optics (annual), Atom Optics (biannual) and Laser cooling and trapping of neutral atoms and BECs (bianual) in the interuniversity BCN Photonics Master/ Erasmus Mundus in Photonics Engineering, Nanophotonics, and Biophotonics.