MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

CURRICULUM VITAE

CV date	18/09/2022

Part A. PERSONAL INFORMATION

First and Family name	Antonio Isaac Fernández Domínguez		
Social Security, Passport, ID number	51074152F	Age	40
Researcher numbers	Researcher ID	C-4448-2013	
	Orcid code	0000-0002-8082-395X	

A.1. Current position

Name of University/Institution	Universidad Autónoma de Madrid			
Department	Física Teórica de la Materia Condensada			
Address and Country	Campus de Cantoblanco, Madrid, Spain			
Phone number	914972769	E-mail	a.fernandez-dominguez@uam.es	
Current position	Profesor Contratado Doctor	From	01/05/2019	
UNESCO nomenclature	221124 – Optical Properties; 220207 – Interaction of electromagnetic waves with matter; 221113 – Interaction of radiation with solids; 221100 – Solid state physics; 220200 – Electromagnetism; 331208 – Material properties; 220210 – Radiowaves and microwaves; 220909 –Infrared radiation; 220911 – Light			
Keywords	Photonic Devices; Optical Properties, Optical Excitationtions, Spectroscopy, Light-Matter Interaction, Electromagnetism, Optics, Solid State Physics, Condensed Matter Physics.			

A.2. Education

PhD	University	Year
Licenciatura Ciencias Físicas	Universidad Autónoma de Madrid	2004
Curso de Adaptación Pedagógica (CAP)	Universidad Complutense de Madrid	2007
Doctor Ciencias Físicas	Universidad Autónoma de Madrid	2009

A.3. Previous Posts

Position	University	Period
Leverhulme Fellow	Imperial College London	2012-2014
Marie Curie Fellow	Imperial College London	2010-2012
Research Associate	Imperial College London	2009-2010
Becario FPU	Universidad Autónoma de Madrid	2005-2009

A.4. Languages

Language	Level
Spanish	Native
English	Fluent
German	Basic

A.5. JCR articles, h Index, thesis supervised…

Overall, I have published more than 100 peer reviewed articles in high impact journals, among them: 1 article in Science, 2 in Nature Photonics, 2 in Nature Physics, 1 in Nature Communications, 1 in Chemical Reviews, 10 in Physical Review Letters, and 7 in Nano Letters. I am first author of 22 of these papers, equal-to-first contributing author in another 9, and last, corresponding author in 28. I am first author of one chapter in the book: “Structured Surfaces as Optical Metamaterials” (Cambridge University Press, 2011) and in the collection “World Scientific Handbook of Metamaterials and Plasmonics (World Scientific, 2017). I have

also published, as second author, the mini-book “Spoof Plasmon Metamaterials” (Cambridge University Press, 2018).

According to Google Scholar (September 2022):

- my work gathers over 9200 citations
- Hirsch factor, h = 44
- i10-index = 80

I have presented my work in over 70 international conferences and seminars. I have co-supervised the PhD thesis of Rui-Qi Li (Nanjing University, China) and Rocío Sáez-Blázquez (UAM). I am currently supervising the ongoing PhD theses of Álvaro Cuartero-González, Jaime Abad-Arredondo and Alberto Miguel Torcal (UAM). I have also supervised several MSc projects at Imperial College London and Universidad Autónoma de Madrid.

Part B. CV SUMMARY

My scientific career began in 2005, when I started my PhD in the group of Prof. F. J. Garcia-Vidal (UAM), under the co-supervision of Prof. L. Martín-Moreno (UniZar). Supported by the FPU studentship programme, I investigated geometric effects in the interaction of light with metals structured at the sub-wavelength scale. My investigation also proved that electromagnetic effects such as extraordinary transmission could be transferred to other wave entities, specifically sound and cold atoms. My dissertation was awarded the Premio Extraordinario de Doctorado (UAM, 2009).

Immediately after my PhD, I accepted a research associate position in the group of Prof. Sir John Pendry and Prof. Stefan Maier at Imperial College London. In 2010, I was awarded an IEF Marie Curie Fellowship, which expired in 2012. My work between 2010 and 2014 focused on the development of a transformation optics framework to describe analytically plasmon-assisted optical phenomena in nanoantennas. I also kept collaborations with various prestigious experimental groups on topics as diverse as photonic crystals, electron energy loss spectroscopy or photonic metamaterials.

In 2012, I was awarded a Ramón y Cajal fellowship and moved back to UAM in April 2014. Since then, I have continued my research on spoof plasmon and optical metamaterials, with both experimental and theoretical collaborations worldwide. I have also extended my previous research line on transformation optics for plasmonics to the exploration of light-matter interactions at the nanoscale, with much focus on the strong coupling between confined electromagnetic modes and microscopic light sources, such as dye molecules or quantum dots. In 2014, I was awarded a European Marie Curie Career Integration Grant on *“Mesoscopic Plasmonics”*, which started in February 2015. I was also awarded a Spanish National Research grant, *“Classical and Quantum Electrodynamics of Light-Matter Coupling”*, as Principal Investigator. In June 2018, I obtained a positive evaluation for the I3 programme, which assessed my scientific production over the duration of my Ramón y Cajal contract. n May 2019, I got tenured as Profesor Contratado Doctor in the Departamento de Física Teórica de la Materia Condensada, Universidad Autónoma de Madrid. Shortly after, I was awarded a Beca Leonardo 2019 para Investigadores y Creadores Culturales, Fundación BBVA. I was also awarded a second Spanish National Research grant, *“Quantum Polaritonic Technologies”*, as Principal Investigator. In September 2020, I became member of the editorial board of Physical Review B.

My personal webpage can be found at: http://webs.ftmc.uam.es/a.fernandez-dominguez/

Part C. RELEVANT MERITS

C.1. 10 Relevant Publications in the period 2016-2020 (in chronological order)

1. *Unveiling the radiative local density of optical states of a plasmonic nanocavity by STM*, A. Martín-Jiménez, A. I. Fernández-Domínguez, K. Lauwaet, D. Granados, R. Miranda, F. J. García-Vidal, and R. Otero, **Nat. Commun.** 11, 1021 (2020).

2. *Fluorescence Triggered by Radioactive β Decay in Optimized Hyperbolic Cavities,* J. Abad-Arredondo, F. J. García-Vidal, Q. Zhang, E. Khwaja, V. M. Menon, J. Grimm, and A. I. Fernández-Domínguezm, **Phys. Rev. Applied** 14, 024084 (2020).

3. *Quasichiral Interactions between Quantum Emitters at the Nanoscale***,** C. Downing, J. C. López-Carreño, F. Laussy, E. del Valle and A. I. Fernández-Domínguez, **Physical Review Letters** 122, 057401 (2019).

4. *Light-Forbidden Transitions in Plasmon-Emitter Interactions beyond the Weak Coupling Regime*, A. Cuartero-González and A. I. Fernández-Domínguez, **ACS Photonics** 5, 3415 (2018).

5. *Unrelenting Plasmons*, A. I. Fernández-Domínguez, F. J. García-Vidal, and L. Martín-Moreno, **Nature Photonics** 11, 8 (2017). 36 citations.

6. *Enhancing Photon Correlations through Plasmonic Strong Couplig*, R. Sáez-Blázquez, J. Feist, A. I. Fernández-Domínguez and F. J. García-Vidal, **Optica** 4. 1363 (2017).

7. *Classical and Ab-Initio Plasmonics Meet at Sub-nanometric Noble Metal Rods*, R: Sinha-Roy, P. García-González, H. C. Weissker, F. Rabilloud and A. I. Fernández-Domínguez, **ACS Photonics** 4, 1484 (2017).

8. Plasmon-Exciton-Polariton Lasing, M. Ramezani, A. Halpin, A. I. Fernández-Domínguez, J. Feist, S. R.-K. Rodríguez, F. J. García-Vidal and J. Gómez-Rivas, **Optica** 4, 31 (2017).

9. *Transformation-Optics Description of Plasmon-Exciton Strong Coupling*, R.-Q. Liu, F. J. García-Vidal, and A. I. Fernández-Domínguez, **Physical Review Letters** 117, 107401 (2016).

10. *Toward cavity quantum electrodynamics with hybrid photon gap-plasmon states,* F. Todisco, M. Esposito, S. Panaro, M. de Giorgi, L. Dominici, D. Ballarini, A. I. Fernández-Domínguez, V. Tasco, M. Cuscuna, A. Passaseo, C, Ciraci, G. Gigli and Daniele Sanvitto, **ACS Nano** 10, 11360 (2015).

C.2. Research projects and grants

1. Title: Nano-Óptica Cuántica de Transformación
   Reference: IN[19]_CBB_FIS_0070
   Principal Investigator: Antonio Isaac Fernández Domínguez
   Funding Agency: Fundación BBVA
   Duration: 01/10/2019 - 31/3/2022
   Funding: 40.000 €
   Current Status: Awarded
2. Title: Quantum Polaritonic Technologies
   Reference: RTI2018-099737-B-I00 (QPOL-TECH)
   Principal Investigator: Antonio Isaac Fernández Domínguez
   Funding Agency: Spanish MICIU
   Duration: 01/01/2019 - 31/12/2021
   Funding: 125.000 €
   Current Status: Awarded
3. Title: Classical and Quantum Description of Light-Matter Coupling
   Reference: FIS2015-64951-R (CLAQUE)
   Principal Investigator: Antonio Isaac Fernández Domínguez
   Funding Agency: Spanish MINECO
   Duration: 01/01/2016 - 31/12/2018
   Funding: 115.000 €
   Current Status: Awarded
4. Title: Mesoscopic Plasmonics
   Reference: PCIG14-GA-2013-630996 (MESOPLAS)
   Principal Investigator: Antonio Isaac Fernández Domínguez
   Funding Agency: Marie Curie Career Integration Grant, EU, FP7

Duration: 15/02/2015 - 14/02/2019
Funding: 100.000 €
Current Status: Awarded

5. Title: Contrato Ramón y Cajal, convocatoria 2012.
Reference: RYC-2012-10738
Principal Investigator: Antonio Isaac Fernández Domínguez
Funding Agency: Ministerio de Economía y Competitividad
Duration: 30/04/2014 - 29/04/2019
Funding: 198.000 €
Current Status: Awarded

6. Title: Nonlinear Plasmonic Metamaterials
Reference: IEF-2009-NONPLASMETA-253626
Principal Investigator: Antonio I. Fernández Domínguez
Funding Agency: Marie Curie Intra European Fellowship, EU, FP7
Duration: 01/06/2010 - 31/05/2012
Funding: 170.000 €
Current Status: Finished

C.3 PhD thesis Supervised and under Supervision

1. Title: Nanostructure Topology Optimization for Quantum Photonics
Student: Alberto Miguel Torcal.
University: University Autónoma de Madrid.
Date: Starting in October 2020.

2. Title: Quantum Polaritonics for Nanophotonics and Material Science.
Student: Jaime Abad-Arredondo.
University: University Autónoma de Madrid.
Date: Starting in September 2019.

3. Title: Transformation Optics Description of Light-Matter Coupling.
Student: Álvaro Cuartero González.
University: University Autónoma de Madrid.
Date: Starting in September 2016.

4. Title: Exciton-Plasmon Strong Coupling in the High Photon Population Regime.
Student: Rocío Sáez Blázquez.
University: University Autónoma de Madrid.
Date: 25 September 2020.

5. Title: Study on the strong coupling phenomenon in open quantum systems and the manipulation of classical waves via artificial microstructures.
Student: Rui-Qi Li.
University: Nanjing University, China.
Date: 21 November 2017 (Defense).

C.4 Other merits

- Premio Extraordinario de Doctorado, Universidad Autónoma de Madrid, Spain, 2009.
- Miembro de la Real Sociedad Española de Física.
- Outreach: “Inagotables Plasmones”, Revista de Física 31-3, 17 (2017).
- Outreach: “La Física de lo Complejo” (https://www.youtube.com/watch?v=RmdWyZpXeEM)
- Organizer of the first Simposium in memoriam of Yannick Sonnefraud, Institute Neel Grenoble, France (http://neel.cnrs.fr/IMG/pdf/Yannick_Symposium_program_29_July.pdf)
- Organizer, Instituto Nicolás Cabrera Summer School “Manipulating Light and Matter at the Nanoscale” (http://www.nicolascabrera.es/summerschool2018/)
- Member of the Scientific Committee, SPP9 conference (http://www.spp9.dk/)
- Member of the Editorial Board of Physical Review B (https://journals.aps.org/prb/staff).