MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE

CV date	08/05/2023

Part A. PERSONAL INFORMATION

First name	Juan Antonio		
Family name	Delgado Notario		
Gender (*)	Male	Birth date (dd/mm/yyyy)	10/02/1990
ID number	45684079F		
e-mail	juanandn@usal.es	URL Web (Link)	
Open Researcher and Contributor ID (ORCID) (*)		0000-0001-9714-8180	

(*) Mandatory

A.1. Current position

Position	Maria Zambrano Distinguished Researcher		
Initial date	01/10/2022		
Institution	University of Salamanca		
Department/Center	Department of Applied Physics – USAL Nanolab		
Country	Spain	Teleph. number	+34 618942090
Key words	THz, sensors, graphene, 2D materials, electronic, 6G communications		

A.2. Previous positions (research activity interruptions, see call)

Period	Position/Institution/Country/Interruption cause
2021-2022	Postdoctoral researcher/CENTERA, Institute of High Pressure of Physics/Poland
2020-2021	Researcher / University of Salamanca/ Spain
2020 (6 months)	Interruption / COVID
2019-2020	JSPS Postdoctoral Research Fellow / Tohoku University/Japan
2015-2018	Clean Room assistant / University of Salamanca / Spain
2014-2019	PhD student and Lecturer Assistant/ University of Salamanca / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD	University of Salamanca / Spain	2019
Master's Degree in Physics	University of Salamanca / Spain	2014
5 years degree physics (Licenciatura)	University of Salamanca / Spain	2013

Part B. CV SUMMARY

I'm a hands-on experimental researcher (PhD 2019) specialized in the fabrication, and characterization of optoelectronic nanodevices made from novel materials for THz technologies with background in Physics science including a 5-years BSc (2013) and a MSc (2014, best student award).

1. Scientific Career

My research career has been developed in 3 international institutions throughout distinct periods: First as PhD student (2014-2019, USAL) supported by two grants: a PTA 2014 (MINECO, 2015-2018) and a Research Fellow grant (2018-2019). Then, after obtaining my PhD (Cum Laude and international mention) I was awarded with the prestigious JSPS fellowship (≈36.5K€) to undertake my first Postdoctoral (PD) stay (Apr.19-Apr.20) at Tohoku University (Japan) at Otsuji´s group (top international group studying the response of novel electron systems operating at THz frequencies). Here I started a new research line focused on researching THz optoelectronic devices based on stacked exfoliated 2d materials. For my second PD stay, I obtained a position at CENTERA in Warsaw, where I finally joined with a 9 month delay due to the COVID pandemic and borders closure. In consequence I was forced to have 6 months break in my career, but I could manage to get a 3 months PD position at USAL (Oct.20-Jan.21). Finally, I joined CENTERA from Feb.21 to Sept.22. This is a R&D unit, funded by W. Knap (re-known scientist in THz science) and formed by expert members to develop breakthrough technologies in the field of THz where I could keep developing my career. In 2022, I was awarded with a Maria Zambrano (MZ) distinguished researcher fellowship (≈99.5K€, Oct.22-Sept.24) to carry out a personal research project developing novel Twistronic THz detectors.

During my career, my goal has been the development of new THz devices leading to the observation of related phenomena which is important for applicative and technological perspectives. My work is accessible to the scientific community by several high impact publications in international journals. Among others, I am the first (FA) and corresponding author (CA) in two works: *Nanophotonics and APL Photonics*. Furthermore, as a result PD periods, I have co-authored several scientific results published in Nat. Comms., Nanoscale and APL among others. In order to foster further my independence, I have also carried out successful 1.5 months PD stays in two groups in Montpellier and Grenoble (see [Phys. Rev. B. 2022]). Finally, I have signed an Art. 83 contract with Prof. Roskos, where I am the PI.

Overall, I have authored 20 scientific articles (9 as FA and 2 as CA), 2 book chapters and 15 proceedings. My h-index is 9 (GS). I have participated in 15 projects. I have presented my scientific works in more than 40 conferences/seminars, being 7 as invited speaker, and 4 as member organizer.

2. Social Contributions

Apart of described above, I also participated in:

-Dissemination of our results and facilities through websites (see 1, 2, 3 and 4) or via laboratory tours to promote science and nanotechnology.

-Director of a TCUE project aiming to develop and use novel THz sensors in industry.

-I worked in two Art.83 (being PI in one) for collaboration between university and social environment and additionally I also cooperated with Technological centers (Warsaw Univ. of Technology and RIKEN THz Center)

-Supporting multidisciplinary research as a technical assistant of advanced tools at the cleanroom facilities at USAL for 3 years (PTA 2014). Here, I oversaw and optimize the working of arriving equipment and training new incoming users (including researchers and external companies). For instance, in this period, I also personally developed and build-up new systems, processes and protocols from the scratch, i.e., homemade 2d stacking system and fabrication of 2d-devices. These protocols are still in use and thus far have contributed to the successful development of several scientific projects undertaken in the center.

3. Mentoring and R&D

Additionally:

- I've co-supervised two MSc Thesis during my stay as JSPS fellow in Japan: H. Sugawara (2021) and Y. Fuse (2020). At present, both are working in Japanese companies.
- I've co-supervised a BSc thesis: Javier Palazuelo (2022). Here I would like also to emphasize my role as Director in our TCUE project aimed to improve links with business. Additionally, he has recently obtained an Investigo grant to start his early scientific career.
- I'm also co-supervising a BSc student in his thesis: Andrés Sanz.
- I mentored 4 visitors (2 PhD- and 2 MSc-students) from abroad.
- I've been a Lecturer assistant from 2016 till 2018 at USAL. Nowadays, as MZ I have lecturer duties at the University.
- Member of a PID (Innovative teaching project).
- I'm external reviewer for 8 JCR journals. Among others ACS Photonics or Scientific Reports (some of them are in my profile). Member of the organizing committee in: TTASS 2022, EDISON '19, Nanolito 2017 and 12th CDE.

Part C. RELEVANT MERITS

C.1. Publications (Last 5 years)

[1] Scientific paper: D. Vaquero, V. Clericò, M. Schmitz, **J.A. Delgado-Notario** et al. and S. Pezzini (CA). "*Phonon-mediated room-temperature quantum Hall transport in graphene*". Nature Communications 14, 318 (2023). DOI: 10.1038/s41467-023-35986-3. Author position: 4/17. Impact Factor: 17.694.

[2] Scientific paper: **J.A. Delgado-Notario (CA)**, W.Knap, V. Clericò et al. and Y.M. Meziani. "*Enhanced terahertz detection of multigate graphene nanostructures*". Nanophotonics, vol. 11, no. 3, pp. 519-529 (2022). DOI: 10.1515/nanoph-2021-0573. Author position: 1/13. Impact Factor: 7.923.

[3] Scientific paper: C. Bray, K. Maussang, C. Consejo, **J. A. Delgado-Notario** et al. and F. Teppe (CA). "*Temperature-dependent zero-field splittings in graphene*". Phys. Rev. B, 106, 245141 (2022). Editors' Choice. DOI: 10.1103/PhysRevB.106.245141. Author position: 4/19. Impact Factor: 3.908.

[4] Scientific paper: A. Rehman, **J.A. Delgado-Notario**, Juan Salvador-Sanchez, et al. and S. Rumyantsev (CA). "*Nature of the 1/f noise in graphene-direct evidence for the mobility fluctuation mechanism*". Nanoscale. 14, 7242-7249 (2022).
DOI: 10.1039/D2NR00207H. Author position: 2/9. Impact Factor: 8.307.

[5] Scientific paper: A. Rehman (CA), **J.A. Delgado-Notario**, P. Sai, et al. and S. Rumyantsev (CA). "*Temperature dependence of current response to sub-terahertz radiation of AlGaN/GaN and graphene transistors*". Appl. Phys. Lett. 121, 213503 (2022).
DOI: 10.1063/5.0129507. Author position: 2/9. Impact Factor: 3.971.

[6] Scientific paper: Jaime Calvo-Gallego, Juan A. Delgado-Notario, Oleg V. Minin, El Hadj Abidi, Miguel Ferrando-Bataller, Kristel Fobelets, Jesús E. Velázquez-Pérez, Igor V. Minin, Yahya M. Meziani. "*Enhancing resolution of terahertz imaging systems below the diffraction limit*". Optics & Laser Technology, 164, 109540 (2023).
DOI: 10.1016/j.optlastec.2023.109540. Author position: 1/9 (**co-first author**). Impact Factor: 4.939.

[7] *Scientific paper:* **J.A. Delgado-Notario (CA)**, V. Clericò, E. Diez, J.E. Velázquez-Pérez, T. Taniguchi, K. Watanabe, T. Otsuji, Y.M. Meziani. "*Asymmetric dual-grating gates graphene FET for detection of terahertz radiations*". APL Photonics 5 (6), 066102 (2020).
DOI: 10.1063/5.0007249. Author position: 1/8. Impact Factor: 5.672.

[8] *Scientific paper:* **J.A. Delgado-Notario**, J. Calvo-Gallego, J. E. Velázquez-Pérez, M. Ferrando-Bataller, K. Fobelets, Y. M. Meziani. "*Effect of the Front and Back Illumination on Sub-Terahertz Detection Using n-Channel Strained-Silicon MODFETs*". Applied Sciences 10 (17), 5959 (2020).
DOI: 10.3390/app10175959. Author position: 1/6. Impact Factor: 2.679.

[9] *Scientific paper:* V. Clericò, **J. A. Delgado-Notario**, M. Saiz-Bretín, et al. and E. Diez (CA). "*Quantum nanoconstrictions fabricated by cryo-etching in encapsulated graphene*". Scientific reports 9 (1), 1-7 (2019). DOI: 10.1038/s41598-019-50098-z. Author position: 2/10. Impact Factor: 3.998.

[10] Scientific paper: **J.A. Delgado-Notario**, J.E. Velazquez-Perez (CA), Y.M. Meziani (CA), K. Fobelets. "*Sub-THz imaging using non-resonant HEMT detectors*". Sensors 18 (2), 543 (2018).
DOI: 10.3390/s18020543. Author position: 1/4. Impact Factor: 3.031.

C.2. Congress

[1] Congress: **J.A. Delgado Notario**. "*Graphene field effect transistors for THz technology and applications*". **Invited speaker**. Name of the congress: GEFES 2023 meeting. February 1-3, 2023. Salamanca, Spain.

[2] Seminar: **J.A. Delgado Notario.** "Fabrication of graphene-based van der Waals heterostructures for THz applications". **Invited speaker**. Seminar organized by team of Prof. Dr. Hartmut Roskos. January 26, 2023. Goethe University, Frankfurt, Germany.

[3] Seminar: **J.A. Delgado Notario**. "Fabrication of graphene-based van der Waals heterostructures for THz applications". **Invited speaker**. Seminar organized by Institute of High-Pressure Physics, Polish Academy of Sciences. March 23, 2021. Poland, Warsaw.

[4] Seminar: **J.A. Delgado Notario**. "Fabrication and Processing of Graphene-based Van Der Waals Devices and their THz Applications". **Invited speaker**. Seminar organized by MSDA laboratory. March 21, 2021. University Mohammed VI Polytechnic, Benguerir, Morocco.

[5] Congress: **J.A. Delgado Notario**. "*Terahertz detection by bilayer graphene multifinger field effect transistor*". **Invited speaker**. Name of the congress: RJUSE-TeraTech 2018. September 17-21, 2018. Warsaw, Poland.

[6] Congress: **J.A. Delgado Notario**, V. Clerico, E. Diez, J.E. Velázquez, T. Taniguchi, K. Watanabe, D. Yadav, T. Otsuji and Y.M. Meziani. "Asymmetric dual grating gate graphene field effect transistors for detection of terahertz radiations". **Invited speaker**. Name of the congress: METANANO 2018. September 17-21, 2018. Sochi, Russia.

[7] Congress: **J.A. Delgado-Notario**, V. Clerico, E. Diez, J. E. Velazquez-Pérez, T. Taniguchi, K. Watanabe, D. Yadav, T. Otsuji and Y.M. Meziani. "*Terahertz Detection with Asymmetric Dual Grating Gate Bilayer Graphene Field-effect-transistor*". **Invited speaker**. Name of the congress: PIERS 2018. August 1 – 4, 2018. Toyama, Japan.

C.3. Research projects

[1] *"María Zambrano para la atracción de talento internacional"*. PI: **Juan Antonio Delgado Notario**. Funding Agency: Spanish Government with support from the EU Commission's 'Next-Generation-EU' framework. Period: Oct. 2022 – Sept. 2024. Amount: 99.5 K€. Role: **Principal Investigator**.

[2] **CENTERA** - "*Center for Terahertz Research and Applications".* PI: Wojciech Knap. Funding Agency: Foundation for Polish Science co-financed by European Union under the European Regional Development Fund. Grant ID: MAB/2018/9. Period: Sept. 2018 – August 2023. Amount: ≈40 Mzł (≈10 M€). Role: **Researcher at the Terahertz plasma instabilities in 2D and 3D nanostructures WP.**

[3] **Graphene-based van der Waals heterostructures for detection and emission of terahertz radiation** - "FY 2019-2020 JPSP Postdoctoral Fellowship for Research in Japan". PI: **Juan Antonio Delgado Notario.** Funding Agency: Japan Society for the Promotion of Science. Period: April. 2019 - April. 2020. Amount: ≈ 4.5 M¥ (≈ 36.5 K€). Role: **Principal Investigator**.

[4] **Creation of 2D-Atomically-Thin-Layered Heterojunctions and their Applications to Novel Terahertz Photonic Devices**". PI: Taiichi Otsuji. Funding Agency: JSPS Japan Society for the Promotion of Science. Grant ID: 16H06361. Period: 2016 FSY – 2020 FSY (April/2016 – March/2020). Amount: 187.98 M¥ (≈1.5 M€). Rol: **Postdoctoral Researcher**.

[5] **Nueva generación de transistores FET para tecnología de THz.** Grant ID: RTI2018-097180-B-I00. PI: J.E. Velázquez Pérez and Y.M. Meziani. Period: 01/2019 - 12/2021. Funding Agency: MINISTERIO DE ECONOMIA Y COMPETITIVIDAD. Amount: 118 K€. Role: **Postdoctoral researcher.**

[6] **Development of Graphene based devices for terahertz applications.** Grant ID: H29/10. PI: Yahya Moubarak Meziani. Period: 04/2017 - 03/2019. Funding Agency: RIEC (Research Institute of Electrical Communication). Amount: 370 K¥ (≈3K€). Role: **Work team – PhD student.**

[7] ***Desarrollo de sensores de THz para aplicaciones de imagen y seguridad*.** Grant ID: TEC2015-65477-R. PI: J.E. Velázquez Pérez and Y.M. Meziani. Period: 01/2016 - 09/2019. Funding Agency: MINISTERIO DE ECONOMIA Y COMPETITIVIDAD. Amount: 107 K€. Role: **Work team – PhD student.**

[8] **Nuevas Tecnologias Basadas En Grafeno y Nanoestructuras Semiconductoras.** Grant ID: SA045U16. PI: Enrique Diez. Period: 01/2016 - 12/2018. Funding Agency: Junta de Castilla y Leon co-financed by FEDER. Amount: 120 K€. Role: **Work team – PhD student and technical assistant.**

[9] **Diseño, Fabricación y Caracterización de Nanodispositivos Electrónicos Bidimensionales.** Grant ID: MAT2013-46308-c2-1-R. PI: Enrique Diez. Period: 01/2014 - 12/2016. Funding Agency: MINISTERIO DE ECONOMIA Y COMPETITIVIDAD. Amount: 101 K€. Role: **Work team – PhD student and technical assistant.**

[10] **ICP Para Ataque en Seco de Nanomateriales.** Grant ID: UNSA13-3E-2691. PI: Enrique Diez. Period: 01/2013 - 12/2015. Funding Agency: AYUDAS A INFRAESTRUCTURAS Y EQUIPAMIENTO CIENTÍFICO-TÉCNICO SUBPROGRAMA ESTATAL DE INFRESTRUCTURAS CIENTÍFICAS Y EQUIPAMIENTO Amount: 582 K€. Role: **Work team – PhD student and technical assistant.**

C.4. Contracts, technological or transfer merits

[1] **Art. 83 Contract**: "Fabrication of lateral graphene/h-BN Moiré superlattices for ultrafast terahertz spectroscopy" Principal Investigator: Juan Antonio Delgado Notario. Company: Johann Wolfgang Goethe-Universität Frankfurt, Germany. Amount: 11000€ Period: 15/05/2023 to 14/05/2024. Role: **Principal Investigator.**

[2] **Transfer:** "*Nanoconstricciones cuánticas en heteroestructuras de grafeno*". Grant ID: PROT_TCUE21-22_043**.** Call: Prototipos orientados al Mercado del Plan de TCUE (Transferencia de Conocimiento Universidad-Empresa) 2021-2023**.** Funding Agency: Junta de Castilla y León co-financed by European Union under the European Regional Development Fund. Role: **Director**.