MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE ABREVIADO (CVA)

Part A. PERSONAL INFORMATION

First name	Sirona		
Family name	Valdueza Felip		
Gender (*)		Birth date	
ID number			
e-mail			
Open Researcher and Contributor ID (ORCID) (*)			

A.1. Current position

Position	Associate Professor		
Initial date	01/04/2021		
Institution	University of Alcalá (UAH)		
Department/Center	Electronics	Polytechnic School	
Country	Spain	Teleph. number	+34 91 885 6908
Key words	Micro, nano and opto-electronics, communications technology, III-V semiconductors, epitaxy and crystal growth, photonics		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
24/01/2021 – 31/03/2021	Contract Professor / University of Alcalá / Spain
09/01/2019 – 23/01/2021	Ramón y Cajal Researcher / University of Alcalá / Spain
06/05/2018 – 08/01/2019	Maternity leave (8 months)
04/05/2015 – 01/12/2018	Ramón y Cajal Researcher / University of Alcalá / Spain
11/03/2013 – 10/03/2015	Marie Curie Researcher / Atomic Energy and Renewable Energy Commission (CEA) of France in Grenoble / France
09/01/2012 – 10/03/2013	Postdoctoral Researcher / CEA-Grenoble / France
01/07/2011 – 08/01/2022	Postdoctoral Researcher / University of Alcalá / Spain
16/04/2007 – 30/06/2011	Doctoral Researcher (FPI) / University of Alcalá / Spain
01/09/2005 – 30/06/2005	Undergraduate Assistant / Univ. Miguel Hernández / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Telecommunication Engineering	University of Alcalá / Spain	28/07/2011
Telecommunication Eng. (5 years degree)	Univ. Miguel Hernández / Spain	23/11/2006

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

I received the Telecommunications Engineering degree from the Miguel Hernández University of Elche in 2006 and the European PhD (Suma Cum Laude with Extraordinary Prize) from the University of Alcalá (UAH) in 2011. During my doctoral stage (2007-2011) I enjoyed an FPI contract from the Ministry of Science and Research in the Photonic Engineering Group (GRIFO) of the UAH, being my main research topic the **development of group III nitride semiconductors for application to telecommunication networks at 1.5 µm**. Within the FPI program I made three short stays for a total of 10 months, two of which were developed at the Commissariat for Atomic and Renewable Energies (CEA) of France in Grenoble (2008 and 2009) and at the University Paris Sud, France (2010).

In January 2012 I moved as a post-doctoral researcher to Grenoble to work for one year at CEA on the development of **solar cells based on InGaN nanostructures on silicon**. In December 2012 I received an **Intra-European Marie Skłodowska-Curie Excellence Grant** from the European Union to continue that line of research for two more years. Thanks to this experience I acquired a wide range of scientific, technical and personal skills such as supervision of students and management of R&D projects within an international framework, allowing me to reach a Ramón y Cajal position in 2014.

In May 2015 I joined GRIFO-UAH as a Ramón y Cajal researcher opening a research line on the development of AlInN-based nanostructures for low-cost solar cells. Likewise, in 2015

and 2016 I obtained funding from the Ministry of Science and Research and from UAH's own program. For the success of the project in January 2016 I started the direction of a PhD thesis on that line of research. In addition, in 2016 I carried out another short stay of 3 months at CEA-Grenoble. In total, throughout my research career I have enjoyed a professional experience abroad of 52 months. From 2021, I am Associate Professor at GRIFO-UAH and I own 2 “sexenios” (2007-2012, 2013-2018).

I am author and co-author of 34 JCR-indexed (Q1: 14, Q2: 12, Q3: 8) and 7 non-indexed (17 first author, 631 citations, h-index: 17 according to Google Scholar) publications, 1 book, 1 book chapter, 12 conference book chapters, 1 publication in popular science journal, 2 articles in press, more than 120 contributions in (inter)national conferences (7 invited) and 4 invited seminars. I am or have been principal investigator of 12 research projects: 1 international, 9 national and 2 infrastructure projects. Co-supervisor of a Master's Thesis (2012) and a Doctoral Thesis (2014). Director of a Final Degree Project (2016) and a Doctoral Thesis (2020), as well as another Doctoral Thesis in progress (defense 2023).

I have been teaching both nationally (UAH) and internationally (University of Grenoble Alpes, France), since 2010, both in Spanish and English and at Bachelor and Master level (696 hours). Likewise, I have given 5 invited seminars in prestigious research centers.

In addition, I have received the 2nd runner-up in the Campus of International Excellence Awards, Intelligent Energy 2017 by UAH and Universidad Rey Juan Carlos (URJC), as well as the Young Researchers in Experimental Sciences Award 2017 by UAH.

Research fields

Previous experience

1. Linear and nonlinear optical characterization of III-nitride nanostructures (thin films, quantum wells and quantum dots) in the near infrared
2. Saturable absorbers and waveguides for ultrafast all-optical switching at 1.5 µm
3. Multi-junction solar cells based on InGaN on silicon and InGaN/GaN quantum wells

Recent activities

1. Fabrication of III-nitride materials (InN, AlN and AlInN) and amorphous silicon by magnetron reactive and non-reactive, RF and DC sputtering
2. Development of AlInN-based solar cells on silicon
3. Development of metal layers and nitride nanostructures by radiofrequency sputtering for fiber optic sensors in the visible and infrared range.

Part C. RELEVANT MERITS

C.1. Publications

1. $Al_xIn_{1-x}N$ on Si(100) solar cells (x=0-0.56) deposited by RF sputtering. S. Valdueza-Felip, R. Blasco, J. Olea, A. Díaz-Lobo, A. Braña, F. B. Naranjo. *Materials 13, 2336* (2020). Q1
2. Design of AlInN on silicon heterojunctions grown by sputtering for solar devices. R. Blasco, F.B. Naranjo, S Valdueza-Felip. *Current Applied Physics 20, 1244 (*2020). Q3
3. Influence of the AlN interlayer thickness on the photovoltaic properties of in-rich AlInN on Si heterojunctions deposited by RF sputtering. R. Blasco, A. Núñez-Cascajero, M. Jiménez-Rodríguez, D. Montero, L. Grenet, J. Olea, F. B. Naranjo, S. Valdueza-Felip. *AIP Advances 8, 115315 (2018).* Q3
4. BOOK: InGaN solar cells: molecular beam epitaxy and metalorganic vapor phase epitaxy approaches - from growth to device. S. Valdueza-Felip. *Editions Universitaires Européennes. OmniScriptum GmbH & Co.* ISBN 978-3-639-54872-3 (2017)
5. Dependence of the photovoltaic performance of pseudomorphic InGaN/GaN MQW solar cells on the active region thickness. A. Mukhtarova, S. Valdueza-Felip, L. Redaelli, Ch. Durand, C. Bougerol, E. Monroy, J. Eymery. *Appl. Phys. Lett. 108, 161907 (2016)*. Q1
6. High In-content InGaN layers synthesized by plasma-assisted molecular-beam epitaxy: Growth conditions, strain relaxation, and In incorporation kinetics. S. Valdueza-Felip, E. Bellet-Amalric, A. Núñez-Cascajero, Y. Wang, M.-P. Chauvat, P. Ruterana, S. Pouget, K. Lorenz, E. Alves, E Monroy. *J. Appl. Phys. 116, 233504 (2014)*. Q2

7. Effect of the quantum well thickness on the performance of InGaN photovoltaic cells. L. Redaelli, A. Mukhtarova, S. Valdueza-Felip, A. Ajay, C. Bougerol, C. Himwas, J. Faure-Vincent, C. Durand, J. Eymery, E. Monroy. *Appl. Phys. Lett. 105, 131105 (2014)*. Q1
8. Improved conversion efficiency of as-grown InGaN/GaN quantum-well solar cells for hybrid integration. S. Valdueza-Felip, A. Mukhtarova, L. Grenet, C. Bougerol, Ch. Durand, J. Eymery, E. Monroy. *Appl. Phys. Express 7, 032301 (2014)*. Q1
9. Carrier localization in InN/InGaN multiple-quantum wells with high In-content. S. Valdueza-Felip, L. Rigutti, F. B. Naranjo, P. Ruterana, J. Mangeney, F. H Julien, M. González-Herráez, E. Monroy. *Appl. Phys. Lett. 101, 062109 (2012)*. Q1
10. High-sensitive SPR sensing with InN as a dielectric overlay of optical fibers. O. Esteban, F. B. Naranjo, N. Díaz-Herrera, S. Valdueza-Felip, M.-C. Navarrete, A. González-Cano. *Sensors & Actuators: B. Chemical, 158, 372 (2011)*. Q1

C.2. Congress, indicating the modality of their participation (invited conf., oral, poster)

I am author or co-author of more than 120 contributions in national and international conferences (7 invited) and 4 invited seminars. Here are the last ones:

1. (Poster) **Study of in-situ Silicon nitridation in AlInN/Si heterojunctions deposited by reactive sputtering.** M. Sun, S. Valdueza-Felip, F.B. Naranjo. *International Workshop on Nitride Semiconductors (IWN), Berlin, Germany, 9-14 October 2022*
2. (Poster) **Development of InN/Si(100) heterojunction devices with a-Si interlayer deposited by reactive sputtering.** M. Sun, J. Nwodo, F.B. Naranjo, S. Valdueza-Felip. *Int'l Workshop on Nitride Semiconductors (IWN), Berlin, Germany, 9-14 October 2022*
3. (Poster) **Low-temperature amorphous silicon deposition by DC sputtering.** M. Sun, S. Valdueza-Felip, F.B. Naranjo. *Nanotech France, Paris, France, 15-17 June 2022*
4. (Oral) **InN on Si(100) photovoltaic devices with an amorphous Si interlayer deposited by DC and RF sputtering.** M. Sun, F.B. Naranjo, S. Valdueza-Felip. *Nanotech France, Paris, France, 15-17 June 2022*
5. (Poster) **Structural analysis of AlInN layers deposited on Si(100) and Si(111) via reactive RF sputtering.** M. Sun, R. Blasco, A. Ajay, E. Monroy, M. de la Mata, S. I. Molina, S. Valdueza-Felip, F.B. Naranjo. *NanoTech France, Online, 25-27 June 2021*
6. (Poster) **Nitruro de aluminio e indio depositado por puleverización catódica RF sobre Si(100) y Si(111): comparativa.** M. Sun, R. Blasco, A. Ajay, E. Monroy, S. Valdueza-Felip, F.B. Naranjo. *XII Sp. Optoel. Meeting, OPTOEL, Online, 30 June 2021*

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

1. **III-nitride graded layers for sputter deposited photovoltaic devices deposited via sputtering** (GRISA). CM/JIN/2021-021. PI: S Valdueza-Felip. Young researcher program 2021 of Com. Madrid / UAH. 01/01/2022 – 31/12/2023. 38.3 k€.
2. **Solar cells based on AlInN/silicon heterostructures deposited by sputtering** (SOLA). CM/JIN/2019-013. PI: S Valdueza-Felip. Young researcher program 2019 of Com. Madrid / UAH. 01/01/2020 – 31/12/2021. 41 k€
3. **Sensors and instrumentation in photonic technologies 2** (SINFOTON2). P2018/NMT-4326. PI: O. Esteban. Developed at UAH. Funded by Com. of Madrid. 01/01/2019 - 31/12/2022. 1 M€
4. **III-nitrides for energy applications** (NERA). RTI2018-101037-B-I00. PI: S. Valdueza-Felip and F. B. Naranjo. RETOS program of Spanish Ministry. Developed at UAH. 01/01/2019 – 30/09/2022. 77.7 k€
5. **III-nitride nanostructures for photovoltaics** (NitPho). TEC2014-60483-R. PI: S Valdueza-Felip. Young-RETOS of Spanish Ministry. Developed at UAH. 01/01/2015 - 31/12/2018. 45.5 k€
6. **Ramón y Cajal research project**. RYC-2013-14084. PI: S Valdueza-Felip. Developed at UAH. Funded by Spanish Ministry. 04/05/2015 - 03/05/2019. 40 k€

7. **Sensors and instrumentation in photonic technologies** (SINFOTON). S2013/MIT-2790-SINFOTON-CM. PI: F. B. Naranjo. Developed at UAH. Funded by Com. of Madrid. 01/10/2014 - 30/09/2018. 724 k€ (46 k€ for UAH)
8. **Marie Curie IEF research project: Solar cells based on InGaN nanostructures on silicon** (SolarIn). #331745. PI: S Valdueza-Felip. Developed at CEA. Funded by European Commission. 11/03/2013 - 10/03/2015. 194 k€ (19 k€ of research budget)
9. **GaN quantum photonic devices for coherent T-ray sources** (TeraGaN). ERC-StG 278428. PI: E. Monroy. Developed at CEA, France. Funded by European Research Council (EU). 01/01/2012 - 31/12/2016. 1.6 M€
10. **Nitride nanostructures for photovoltaics** (NANIPHO). A-CIEBC-01-02-02-05. IP: E. Monroy. Developed at CEA, France. Funded by DSM-Energie / CEA. 01/01/2012 - 01/01/2013. 70 k€

C.4. Contracts, technological or transfer merits, include patents and other industrial or intellectual property activities (contracts, licenses, agreements) in which you have collaborated

- Development of new techniques and information systems for the sustainable rehabilitation of road pavements. Art. 83. IP: M. González-Heráez. 01/01/2016 – 30/09/2018. 57 k€

C.5. Awards and distinctions

- Young Researcher Award in Experimental Sciences, University of Alcalá, 2017
- 2nd Runner-up UAH-URJC Campus of Excellence Int'l Awards, Intelligent Energy 2017
- Ramón y Cajal grant from MICINN in 2014
- Marie Curie Excellence Grant (IEF #331745) from the European Commission, 2012
- Young Researcher Award of the Eur. Materials Research Society, France, 2011
- PhD Extraordinary Award, Universidad de Alcalá, 2011

C.6. Short stays

- *Inst. Nanoscience and Cryogenics* (INAC), CEA, Grenoble, France (7 months, 2008-09)
- *Fundamental Electronics Institute*, University Paris-Sud (3 months, 2010)
- *Physics & Astronomy Dept*., University of Porto, Portugal (1 week, 2010)
- INAC-CEA, Grenoble, France (3 months, 2016)

C.7. Supervision of students

- Collaboration in the supervision of the Master's Thesis of Q. Pan “Heterosstructured GaN single-nanowire photodetectors”. CEA-Grenoble, Univ. Grenoble Alpes, France, 2012
- Collaboration in the supervision of PhD of A. Mukhtarova “Quantum wells of InGaN/GaN nitride compounds for photovoltaics”. CEA, Univ. Grenoble Alpes, France, 2014
- Director of the Final Degree Project of G. Cabañas “Automation of an optical measurement system at cryogenic temperatures”. UAH, 2016
- Co-director of Doctoral Thesis of R. Blasco “Development of solar cells based on AlInN/silicon heterostructures deposited by sputtering” UAH. Excellent Cum Laude, 2020
- Co-director of Doctoral Thesis of M. Sun “Heterostructures based on poly-silicon and group III nitrides deposited by sputtering” UAH. Defense in 2023

C.8. Others

- Regular reviewer of international journals since 2013: Thin Solid Films, Physica Status Solidi (a), Superlattice and Microstructures, Chinese Optic Letters, J. Appl. Phys., Solar Energy Mat. y Solar Cells, Appl. Phys. Express, and Phot. Tech. Letters
- External and on-site scientific-technical evaluator of Spanish R&D projects of challenges and excellence, in the area of TIC in 2017 and 2019
- Languages: Spanish (native), English (C1), German (C1), French (C1), Italian (B2) and Catalan (C1)