

Curriculum Vitae

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PERSONAL INFORMATION

Lucas Vázquez Besteiro

Born in Sarria (Lugo), Spain - Spanish nationality

IFFS Postdoctoral fellow
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POSITIONS

Institute of Fundamental and Frontier Sciences - University of Electronic Science and Technology of China, Chengdu, Sichuan, China

Institut National de la Recherche Scientifique - Énergie, Matériaux et Télécommunications, Varennes, Québec, Montreal

- IFFS postdoctoral fellow, jointly appointed Sep 2017 – Present
 - Fundamental research in material science, nanophotonics and plasmonics, with a strong emphasis on direct collaboration with experimental groups working in photovoltaics, photocatalysis, nanoheating, EELS characterization and nanothermometry, among other topics.
 - Advisers: Prof. Zhiming Wang (UESTC) and Prof. Federico Rosei (INRS)

Department of Physics and Astronomy - Ohio University, Athens, Ohio, USA

- Postdoctoral researcher Aug 2014 – Jul 2017
 - Theoretical research in the fields of nanophotonics and plasmonics, using computational resources to model systems of fundamental and technological interest. I was involved in a variety of projects studying phenomena such as plasmonic hot electron generation, chiral signal enhancement, plasmon dynamics and nanoheating. The position included some teaching opportunities.
 - Adviser: Prof. Alexander O. Govorov

EDUCATION

Universidad de Santiago de Compostela, Santiago de Compostela, Spain

- PhD in Material Science Oct 2009 – Jul 2014
 - Thesis: Influence of Dimensionality on Structural and Electronic Properties of Semiconductor Nanomaterials: Quantum Dots, Nanowires and Nanotubes
 - Description: A study, through *ab initio* calculations, on III-V semiconductor materials, focusing on the effects of quantum confinement in nanostructures with different dimensionality
 - Advisers: Prof. Manuel M.G. Alemany and Prof. Luis J. Gallego
- MS in Material Science Oct 2008 – Jul 2009
 - Thesis: Efficient *n*-type doping of semiconductor nanocrystals with crystalline nucleus of zinc-blende structure
 - Description: Postgraduate degree oriented towards doctoral studies
 - Advisers: Prof. Manuel M.G. Alemany and Prof. Luis J. Gallego
- Extended BS in Physics Oct 2002 – Sep 2008
 - Description: Generalist degree on Physics (*Licenciatura*), with the last two years centered upon theoretical and particle Physics

Universidad Nacional de Educación a Distancia, Madrid, Spain

- MS in Physics of Complex Systems Oct 2012 – Sep 2015
 - Thesis: Simple Recommendation Model as a Mechanism for Idea Transmission
 - Description: Posgraduate distance education degree with a focus on social and neural networks.
 - Adviser: Prof. Javier de la Rubia

TEACHING	<p>Ohio University, Athens, Ohio, USA</p> <p>Teaching:</p> <ul style="list-style-type: none"> ▪ <i>Graduate</i> PHYS 6031: Electrodynamics (Substitute Lecturer, 2 weeks) Spring 2015 & 2016 Textbook: J. D. Jackson, Classical Electrodynamics 3rd Ed. ▪ <i>Undergraduate</i> PHYS 3011, 5011: Thermal Physics (Substitute Lecturer, 2 weeks) Spring 2015 & 2016 Textbook: Daniel V. Schroeder, Introduction to Thermal Physics <p>Additional experience:</p> <ul style="list-style-type: none"> ▪ <i>Prof. Development - Participation</i> on Seminar PHYS 8101: Teaching College Physics. Spring 2017 Overview of evidence-based Physics education and Active Learning. ▪ <i>Outreach</i> - Science demonstrations and activities at a variety of Family Science Events, Department's Open Houses and Regional Science Fairs Spring 2017
SERVICE	<p>Reviewer 2015 – Present</p> <ul style="list-style-type: none"> • Applied Sciences • Europhysics Letters • Journal of Physical Chemistry C • Materials • Materials Today Communications • Metals • Nanophotonics • Nano Energy • New Journal of Physics • Physical Review Letters • Scientific Reports • Semiconductor Science and Technology • Sensors • Symmetry <p>Postdoctoral Association, Ohio University</p> <ul style="list-style-type: none"> ▪ Coordinator Oct 2016 – Aug 2017 <ul style="list-style-type: none"> • Organization of mentoring sessions for postdoctoral scholars • Organization of Postdoctoral Symposium <p>Student Expo, Ohio University</p> <ul style="list-style-type: none"> ▪ Judge Apr 2017
PROFESSIONAL AFFILIATIONS	<p>American Physical Society, College Park, Maryland, USA 2010 – Present</p> <p>National Postdoctoral Association, Rockville, Maryland, USA 2016 – Present</p>

PUBLICATIONS

- [23] R. Marin, A. Skripka, L.V. Besteiro, A. Benayas, Z. Wang, A.O. Govorov, P. Canton, F. Vetrone
Highly Efficient Copper Sulfide Based Near Infrared Photothermal Agents: Exploring the Limits of Macroscopic Heat Conversion
Small, DOI: 10.1002/sml.201803282 (2018)
- [22] P. Yu, L.V. Besteiro, Y. Huang, L. Fu, H.H. Tan, C. Jagadish, G.P. Wiederrecht, A.O. Govorov, Z. Wang
Broadband Metamaterial Absorber
Adv. Opt. Mat., DOI: 10.1002/adom.201800995 (2018)
- [21] L.M. Kneer, E.M. Roller, L.V. Besteiro, R. Schreiber, A.O. Govorov, T. Liedl
Circular Dichroism of Chiral Molecules in DNA-Assembled Plasmonic Hotspots
ACS Nano **12**, 9110 (2018)
- [20] P. Yu, L.V. Besteiro, J. Wu, Y. Huang, Y. Wang, A.O. Govorov, Z. Wang
Metamaterial perfect absorber with unabated size-independent absorption
Opt. Express **26**, 20471 (2018)
- [19] X.-T. Kong, L.V. Besteiro, Z. Wang, A.O. Govorov
Plasmonic Chirality and Circular Dichroism in Bio-assembled and Non-biological Systems: Theoretical Background and Recent Progress
Adv. Mater., *accepted* (2018)
- [18] L.V. Besteiro, X.-T. Kong, Z. Wang, F. Rosei, A.O. Govorov
Plasmonic Glasses and Films Based on Alternative Inexpensive Materials for Blocking Infrared Radiation
Nano Lett. **18**, 3147 (2018)
- [17] Z. Xu, Md.G. Kibria, B. AlOtaibi, P.N. Duchesne, L.V. Besteiro, Y. Gao, Q. Zhang, Z. Mi, P. Zhang, A.O. Govorov, L. Mai, M. Chaker, D. Ma
Towards enhancing photocatalytic hydrogen generation: which is more important, alloy synergistic effect or plasmonic effect?
Appl. Catal., B **221**, 77 (2018)
- [16] L.V. Besteiro, X.-T. Kong, Z. Wang, G. Hartland, A.O. Govorov
Understanding Hot-Electron Generation and Plasmon Relaxation in Metal Nanocrystals: Quantum and Classical Mechanism
ACS Photonics **4**, 2759 (2017)
- [15] A. Cecconello, L.V. Besteiro, A.O. Govorov, I. Wilner
Chiroplasmonic DNA-Based Nanostructures
Nature Reviews Materials **2**, 17039 (2017)
- [14] G. Hartland, L.V. Besteiro, P. Johns and A.O. Govorov
What's Hot about Electrons in Metal Nanoparticles?
ACS Energy Letters **2**, 1641 (2017)
- [13] E.-M. Roller*, L.V. Besteiro*, C. Pupp, L.K. Khorasad, A.O. Govorov, T. Liedl
Hot Spot-Mediated non-Dissipative and Ultrafast Plasmon Passage
Nature Phys. **13**, 761 (2017)
* Authors contributed equally
- [12] L.V. Besteiro, H. Zhang, J. Plain, G. Markovich, Z. Wang, A.O. Govorov
Aluminum Nanoparticles with Hot Spots for Plasmon-Induced Circular Dichroism of Chiral Molecules in the UV Spectral Interval
Adv. Opt. Mater. **5**, 1700069 (2017)
- [11] A. Naldoni, U. Guler, Z. Wang, M. Marelli, F. Malara, X. Meng, L.V. Besteiro, A.O. Govorov, A.V. Kildishev, A. Boltasseva, V.M. Shalaev
Broadband Hot Electron Collection for Solar Water Splitting with Plasmonic Titanium Nitride
Adv. Opt. Mater. **5**, 1601031 (2017)
- [10] L.V. Besteiro, K. Gungor, H.V. Demir, A.O. Govorov
Simple and Complex Metafluids and Metastructures with Sharp Spectral Features in a Broad Extinction Spectrum: Particle-Particle Interactions and Testing the Limits of the Beer-Lambert Law
J. Phys. Chem. C, **121**, 2987 (2017)

- [9] L.V. Besteiro, A.O. Govorov
Amplified Generation of Hot Electrons and Quantum Surface Effects in Nanoparticle Dimers with Plasmonic Hot Spots
J. Phys. Chem. C, **120**, 19329 (2016)
- [8] M.R. Kim, H.A. Hafez, X. Chai, L.V. Besteiro, L. Tan, T. Ozaki, A.O. Govorov, R. Izquierdo, D. Ma
Covellite CuS Nanocrystals: Realizing Rapid Microwave-assisted Synthesis in Air and Unravelling the Disappearance of their Plasmon Resonance after Coupling with Carbon Nanotubes
Nanoscale, **8**, 12946 (2016)
- [7] L.K. Khorasad, L.V. Besteiro, Z. Wang, J. Valentine, A.O. Govorov
Localization of Excess Temperature Using Plasmonic Hot Spots in Metal Nanostructures: Combining Nano-Optical Antennas with the Fano Effect
J. Phys. Chem. C, **120**, 13215 (2016)
- [6] J. Yang, N.J. Kramer, K.S. Schramke, L.M. Wheeler, L.V. Besteiro, C.J. Hogan Jr., A.O. Govorov, U.R. Kortshagen
Broadband Absorbing Exciton-Plasmon Metafluids with Narrow Transparency Windows
Nano Lett., **16**, 1472 (2016)
- [5] W. Li, Z.J. Coppens, L.V. Besteiro, W. Wang, A.O. Govorov, J. Valentine
Circularly Polarized Light Detection with Hot Electrons in Chiral Plasmonic Metamaterials
Nat. Commun., **6**, 8379 (2015)
- [4] H. Harutyunyan, A.B.F. Martinson, D. Rosenmann, L.K. Khorashad, L.V. Besteiro, A.O. Govorov, G.P. Wiederrecht
Anomalous Ultrafast Dynamics of Hot Plasmonic Electrons in Nanostructures with Hot Spots
Nat. Nanotechnol., **10**, 770 (2015)
- [3] L.V. Besteiro, L. Tortajada, J. Souto, L.J. Gallego, J.R. Chelikowsky, M.M.G. Alemany
Doping Efficiency in n-type InP Nanowires
Phys. Rev. B, **88**, 115310 (2013)
- [2] L. Tortajada, L.V. Besteiro, M.L. Tiago, L.J. Gallego, J.R. Chelikowsky, M.M.G. Alemany
Multidimensional Nanoscale Materials from Fused Quantum Dots
Phys. Rev. B, **84**, 205326 (2011)
- [1] L.V. Besteiro, L. Tortajada, M.L. Tiago, L.J. Gallego, J.R. Chelikowsky, M.M.G. Alemany
n-type Doping via Avoiding the Stabilization of DX Centers in InP Quantum Dots
Phys. Rev. B, **81**, 121307 (2010)

- INVITED TALKS**
- [24] MRS-SMM International Material Research Congress, Cancun, Mexico 2018
L.V. Besteiro, X.-T. Kong, Z. Wang, A.O. Govorov
Hot Electron Generation for Solar Energy Conversion: Phenomenological Theoretical Framework and Practical Design Insights
- [23] META - International Conference on Metamaterials, Photonic Crystals and Plasmonics, Marseille, France 2018
L.V. Besteiro, X.-T. Kong, Z. Wang, F. Rosei, A.O. Govorov
Plasmonic Nanomaterials as Infrared-Blocking Radiation Filters and Energy-Saving Glasses
- SEMINARS**
- [22] DIPC, San Sebastian, Spain 2017
Hot Carrier Generation in Plasmonic Nanoparticles
- [21] IFFS - UESTC, Chengdu, Sichuan, China 2017
Hot Carrier Generation in Plasmonic Nanoparticles
- [20] CMSS Colloquium, Athens, Ohio, USA 2016
Hot Carrier Generation in Plasmonic Nanoparticles
- TALKS**
- [19] Single Nanostructures, Nanomaterials, Aerogels and their Interactions: Combining Quantum Physics and Chemistry, Dresden, Germany 2018
L.V. Besteiro, X.-T. Kong, A.O. Govorov
Plasmonic Nanoparticles in Near-Field Interaction: Energy Conversion and Coherent Plasmon Transfer
- [18] APS March Meeting, Los Angeles, California, USA 2018
L.V. Besteiro, E.-M. Roller, L. Khosravi Khorashad, T. Liedl, A.O. Govorov
Ultra-Fast Light Energy Transfer with Suppressed Losses Through Hot-Spots in Heterogeneous Plasmonic Arrays
- [17] Ohio University Postdoctoral Symposium, Athens, Ohio, USA 2017
L.V. Besteiro, L. Khosravi Khorashad, X.-T. Kong, A.O. Govorov
Plasmonics: Fundamentals and Applications
- [16] APS March Meeting, New Orleans, Louisiana, USA 2017
L.V. Besteiro, X.-T. Kong, A.O. Govorov
Modeling the generation of hot plasmonic electrons in metal nanocrystals with hot spots. A quantum model
- [15] APS March Meeting, Baltimore, Maryland, USA 2016
L.V. Besteiro, H. Zhang, A.O. Govorov
Kinetic Density Functional Theory for Plasmonic Nanostructures
- [14] APS March Meeting, San Antonio, Texas, USA 2015
L.V. Besteiro, H. Zhang, K. Gungor, H.V. Demir, A.O. Govorov
Plasmonic metastructures exhibiting a narrow transparency window within a broad extinction spectrum
- [13] ANM - International Conference on Advanced Nano Materials, Aveiro, Portugal 2014
L.V. Besteiro, L.J. Gallego, M.M.G. Alemany
DX-like Defect Formation in Zinc-Blende III-IV Semiconductor Nanowires
- [12] APS March Meeting, Denver, Colorado, USA 2014
L.V. Besteiro, L. Tortajada, J. Souto, L.J. Gallego, J.R. Chelikowsky, M.M.G. Alemany
Efficient n-type doping of zinc-blende III-V semiconductor nanowires
- [11] APS March Meeting, Portland, Oregon, USA 2010
L.V. Besteiro, L. Tortajada, M.L. Tiago, L.J. Gallego, J.R. Chelikowsky, M.M.G. Alemany
Efficient n-type doping of zinc-blende III-V semiconductor quantum dots
- [10] IAPS International Conference of Physics Students, Graz, Austria 2010
- [9] IAPS International Conference of Physics Students, Split, Croatia 2009

- CONTRIBUTED TALKS**
- [8] SPIE Nanoscience + Engineering, San Diego, California, USA 2018
A.O. Govorov, L.V. Besteiro
Quantum and classical phenomena in bio-plasmonic nanostructures and assemblies
 - [7] APS March Meeting, Los Angeles, California, USA 2018
L. Khosravi Khorashad, L.V. Besteiro, A.O. Govorov
Plasmonic Heating: Efficient and Controlled Heating at the Nanoscale
 - [6] APS March Meeting, Los Angeles, California, USA 2018
A.O. Govorov, L.V. Besteiro, X.-T. Kong, Z. Wang, G. Wiederrecht
Hot-electron generation in plasmonic nanostructures with hot spots: Quantum mechanisms
 - [5] APS March Meeting, New Orleans, Louisiana, USA 2017
A.O. Govorov, L.V. Besteiro, L. Khosravi Khorashad, X-T. Kong, E.-M. Roller, T. Liedl
Quantum and Classical Plasmonic Phenomena in Nanoparticle Arrays
 - [4] APS March Meeting, New Orleans, Louisiana, USA 2017
L. Khosravi Khorashad, L.V. Besteiro, A.O. Govorov
Photothermal Plasmonic Effects and Localization of Excess Temperature Using Metal Nanostructures
- POSTERS**
- [3] Ohio University Postdoctoral Symposium, Athens, Ohio, USA 2017
L.V. Besteiro, L. Khosravi Khorashad, N. Liu, A. Kuzyk, E.-M. Roller, T. Liedl, A.O. Govorov
Chiral Nanocrystal Bio-Assemblies with Plasmonic and Excitonic Resonances
 - [2] Statussymposium on Functional Macroscopic Systems, Hannover, Germany 2016
L.V. Besteiro, L. Khosravi Khorashad, N. Liu, A. Kuzyk, E.-M. Roller, T. Liedl, A.O. Govorov
Chiral Nanocrystal Bio-Assemblies with Plasmonic and Excitonic Resonances
 - [1] NANOSA, Dresden, Germany 2015
L.V. Besteiro, H. Zhang, A.O. Govorov
Kinetic density functional theory for plasmonic nanostructures. Theoretical overview and applications

[CV compiled on 2018-10-18]