Yael Gutiérrez Vela

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EDUCATION

- **2016 - 2019** PhD in Physics at University of Cantabria (Spain)
  Thesis: *Plasmonics by unconventional nanostructured materials for UV applications.*
- **2014** – **2015** MSc in Physics at University of Cantabria (Spain)
  Master thesis: *Electromagnetic behavior Rh nanostructures in the UV.*
  Grade: 9.3/10.0
- **2010** – **2014** BSc in in Physics at University of Cantabria (Spain)
  BSc Thesis: *Electromagnetic response of dipolar nano-antennas in near and far-field.*
  Grade: 9.1/10.0 (Graduated with honors)

WORK EXPERIENCE

- **Jan 2020** – **Present** Postdoctoral Fellow at ÚFE (Prague, Czech Republic)
- **Feb 2016** – **Oct 2019** Predoctoral Fellow at Department of Applied Physics, University of Cantabria (Spain)
- **Oct 2015** – **Feb 2016** Research Assistant at Department of Applied Physics, University of Cantabria (Spain)
- **Jul 2013** – **Oct 2013** Research Assistant at R&D Department, Hispano Italiana de Revestimientos, S.A. (Spain)

PUBLICATIONS

1. **Gutiérrez, Y.**; Giangregorio, M.M.; Brown, A.S.; Moreno, F.; Losurdo, M. Understanding Electromagnetic Interactions and Electron Transfer in Ga Nanoparticle–Graphene–Metal Substrate Sandwich Systems. Appl. Sci. 2019, 9, 4085.
2. **Gutiérrez, Y.**; González, F.; Moreno, F. The UV Plasmonic Behavior of Rhodium Tetrahedrons — A Numerical Analysis. Appl. Sci. 2019, 9, 3947.
3. **Gutiérrez, Y.**; Losurdo, M.; García-Fernández, P.; Sainz de la Maza, M.; González, F.; Brown, A.S.; Everitt, H.O.; Junquera, J.; Moreno, F. Dielectric function and plasmonic behavior of Ga (II) and Ga (III). Opt. Mater. Express 2019, 9, 4050–4060.
4. Barreda, A. I; **Gutiérrez, Y.**; Alcaraz de la Osa, R.; Moreno, F.; González, F.; *High Refractive Index Dielectric nanoparticles for improving energy effciency of solar cells.* J. Quant. Spectrosc. Radiat. Transf. 236, 106573 (2019).
5. **Gutiérrez, Y.**; Ortiz, D; Alcaraz de la Osa, R.; Saiz, J. M.; González, F.; Moreno, F.; *Electromagnetic effective medium modelling of composites with metal-semiconductor core-shell type inclusions.* Catalysts 9(7), 626 (2019).
6. **Gutiérrez, Y.**; Losurdo, M.; García-Fernández, P.; Sainz de la Maza, M.; González, F.; Brown, A. S; Everitt, H. O.; Junquera, J.; Moreno, F.; *Gallium Polymorphs: Phase-Dependent Plasmonics.* Adv. Opt. Mater. 1900307, 1900307 (2019).
7. **Gutiérrez, Y.**; Giangregorio, M. M.; Palumbo, F.; Brown, A. S.; Moreno, F.; Losurdo, M.; *Optically Addressing Interaction of Mg / MgO Plasmonic Systems with Hydrogen.* Opt. Express **2019**, 27 (4), A197–A205.

8. **Gutiérrez, Y.**; Alcaraz, R.; Osa, D.; Ortiz, D.; Saiz, J. M.; González, F.; Moreno, F.; *Plasmonics in the Ultraviolet with Aluminum, Gallium, Magnesium and Rhodium*. *Appl. Sci.* **2018**, *8* (1), 64.
9. Zhang, X.; Li, X.; Reish, M. E.; Zhang, D.; Su, N. Q.; **Gutiérrez, Y.**; Moreno, F.; Yang, W.; Everitt, H. O.; Liu, J.; *Plasmon-Enhanced Catalysis: Distinguishing Thermal and Nonthermal Effects*. Nano Lett. **2018**, *18* (3), 1714–1723.
10. **Gutiérrez, Y.**; Ortiz, D.; Saiz, J.; González, F.; Albella, P.; Moreno, F.; *The Quest for Low Loss High Refractive Index Dielectric Materials for UV Photonic Applications*. Appl. Sci. **2018**, 8 (11), 2065.
11. Barreda, Á. I.; **Gutiérrez, Y.**; Sanz, J. M.; González, F.; Moreno, F.; *Light Guiding and Switching Using Eccentric Core-Shell Geometries*. *Sci. Rep.* **2017**, *7* (1), 11189.
12. **Gutiérrez, Y.**; Ortiz, D.; Saiz, J.; González, F.; Everitt, H.; Moreno, F.; *The UV Plasmonic Behavior of Distorted Rhodium Nanocubes*. Nanomaterials **2017**, *7* (12), 425.
13. Yuffa, A. J.; **Gutiérrez, Y.**; Sanz, J. M.; Alcaraz de la Osa, R.; Saiz, J. M.; González, F.; Moreno, F.; Videen, G.; *Near- and Far-Field Scattering Resonance Frequency Shift in Dielectric and Perfect Electric Conducting Cylinders*. J. Opt. Soc. Am. A **2016**, 33 (3), 391.
14. **Gutiérrez, Y.**; Ortiz, D.; Sanz, J. M.; Saiz, J. M.; Gonzalez, F.; Everitt, H. O.; Moreno, F.; *How an Oxide Shell Affects the Ultraviolet Plasmonic Behavior of Ga, Mg, and Al Nanostructures*. Opt. Express **2016**, 24 (18), 20621.
15. Zhang, X.; Li, P.; Barreda, Á.; **Gutiérrez, Y.**; González, F.; Moreno, F.; Everitt, H. O.; Liu, J.; *Size-Tunable Rhodium Nanostructures for Wavelength-Tunable Ultraviolet Plasmonics*. Nanoscale Horiz. **2016**, 1 (1), 75–80.
16. Barreda, Á. I.; **Gutiérrez, Y.**; Sanz, J. M.; González, F.; Moreno, F.; *Polarimetric Response of Magnetodielectric Core–Shell Nanoparticles: An Analysis of Scattering Directionality and Sensing*. Nanotechnology **2016**, 27 (23), 234002.
17. Yuffa, A. J.; **Gutiérrez, Y.**; Sanz, J. M.; Alcaraz de la Osa, R.; Saiz, J. M.; González, F.; Moreno, F.; Videen, G.; *Frequency Shift between Near- and Far-Field Scattering Resonances in Dielectric Particles*. J. Opt. Soc. Am. A **2015**, 32 (9), 1638.

CONFERENCE PROCEEDINGS

1. Barreda, A. I.; **Gutiérrez, Y.**; Sanz, J. M.; Gonzalez, F.; Moreno, F. *Eccentric Metallo-Dielectric Core-Shell Nanoparticles for Switching and Guiding Purposes*. In 2018 12th International Congress on Artificial Materials for Novel Wave Phenomena (Metamaterials); IEEE, 2018; pp 049–051.
2. Losurdo, M.; **Gutiérrez, Y.**.; Giangregorio, M. M.; Humlicek, J.; Moreno, F.; Brown, A. *Multiphase Gallium-Based Nanoparticles for a Versatile Plasmonic Platform*. In Advanced Photonics **2018** (BGPP, IPR, NP, NOMA, Sensors, Networks, SPPCom, SOF); OSA: Washington, D.C., 2018; p NoTh3D.4.
3. **Gutiérrez, Y.**; Ortiz, D.; Saiz, J. M.; González, F.; Moreno, F. *Scattering Directionality in the UV*. In Advanced Photonics 2018 (BGPP, IPR, NP, NOMA, Sensors, Networks, SPPCom, SOF); OSA: Washington, D.C., **2018**; p JTu2A.37.
4. Alcaraz de la Osa, R.; Fernández Pérez, A.; **Gutiérrez, Y.**; Ortiz, D.; González, F.; Moreno, F.; Saiz, J. M. *The Extended Kubelka-Munk Theory and Its Application to Colloidal Systems*. In Third International Conference on Applications of Optics and Photonics; Martins Costa, M. F. P., Ed.; SPIE, **2017**; p 92.
5. **Gutiérrez, Y.**; Ortiz, D.; Alcaraz de la Osa, R.; Sanz, J. M.; Saiz, J. M.; Gonzalez, F.; Moreno, F. *Modelling Metal-Dielectric Core-Shell Nanoparticles with Effective Medium*

Theories. In Third International Conference on Applications of Optics and Photonics; Martins Costa, M. F. P., Ed.; SPIE, **2017**; p 93.

6. Moreno, F.; **Gutiérrez, Y.**; González, F.; Alcaraz de la Osa, R.; Sanz, J. M.; Ortiz, D.; Everitt, H. O.; Saiz, J. M. *Recent Advances in Metals for Plasmonics Applications in the UV Range*. In UV and Higher Energy Photonics: From Materials to Applications 2017; Lérondel, G., Cho, Y.-H., Kawata, S., Eds.; SPIE, **2017**; p 10.
7. Zhang, X.; **Gutiérrez, Y.**; Li, P.; Barreda, Á. I.; Watson, A. M.; Alcaraz de la Osa, R.; Finkelstein, G.; González, F.; Ortiz, D.; Saiz, J. M.; et al. *Plasmonics in the UV Range with Rhodium Nanocubes*; Andrews, D. L., Nunzi, J.-M., Ostendorf, A., Eds.; **2016**; Vol. 9884, p 98841E.
8. **Gutiérrez, Y.**; Barreda, Á. I.; González, F.; Moreno, F. *Spectral Response of Dielectric Nano-Antennas in the Far- and near-Field Regime*s; Adibi, A., Lin, S.-Y., Scherer, A., Eds.; 2016; Vol. 9756, p 975628.

CONFERENCE and WORKSHOPS

Over **15 oral** contributions and **5 poster** presentations in international conferences.

FELLOWSHIPS

- **2019** – Erasmus+ program to teach at Johannes Kepler University
- **2019** – CNR Associate Researcher.
- **2016** – **2019** PhD fellowship by the University of Cantabria
- **2015** – **2016** Master fellowship by the University of Cantabria
- **2013** – **2014** Department Collaboration fellowship from the Spanish Ministry of Culture, Education and Sports for the realization of a research project at Department of Applied Physics (University of Cantabria)
- **2013** CRUE-CEPYME fellowship from Banco Santander to work at the R&D Department of Hispano Italiana de Revestimientos, S.A. (Spain)

AWARDS

- **2019** – SPIE Optics+Photonics 2019 Young Scientist Best Paper Award
- **2014** Physics Top Promotion Award

STAYS IN RESEARCH CENTERS

- **Sep 2018** – **Dec 2018** With Dr. M. Losurdo at CNR-NANOTEC (Bari, Italy)
  Working on plasmonic photocataysis. Funded by University of Cantabria.
- **Nov 2016** – **Dec 2016** With Dr. V. Silkin at DIPC (San Sebastian, Spain)
  Working on the calculation of the dielectric function of materials through first-principles calculations. Funded by DPIC.
- **Jun 2014 - Aug 2014** With Dr. R. Zia at Brown University (Providence, RI, USA)
  Doing part of my BSc thesis. Funded by University of Cantabria.

PARTICIPATION IN FUNDED PROJECTS

- **Jan 2017** – **June 2019** Research Assistant at University of Cantabria

Project Entitled: New Hybrid Metallic Materials for UV plasmonics and Photocatalysis Applications.
Funding: US Army International Center-Atlantic.

- **Oct 2015 – Feb 2016** Research Assistant at University of Cantabria
  Project Entitled: Improving the energetic efficiency of solar cells by using dielectric nanostructures
  Funding: Iberdrola Foundation.

TEACHING EXPERIENCE

- **2019** Erasmus+ teaching at Johannes Keppler University (Austria)
- **2019** Co-supervisor of a BSc thesis. University of Cantabria (Spain)
- **2016 – 2019** Experimental Optics. University of Cantabria (Spain)
- **2017 – 2018** Basic Experimental Physics: Optics & Sound. University of Cantabria (Spain)

OTHER SCIENCE-RELATED ACTIVITIES

- **2016-2019** PhD student and teaching assistant representative at the University of Cantabria cloister.
- **2016-2019** PhD student representative at Doctoral School of the University of Cantabria.
- **2017-2019** PhD student representative at the commission of academic ordination of the University of Cantabria.

RELEVANT SKILLS

- Languages: Spanish (mother tongue), English (C1 level), French (B1 level).
- Programming: Fortran and Python (medium level), MATLAB (advanced level).
- Electromagnetic simulation software: COMSOL Multiphysics and FDTD Lumerical (advanced level).
- DFT calculations: SIESTA (medium level, 40 h training at SIESTA school 2017).
- Experimental techniques: spectroscopic ellipsometry, Raman and FTIR spectroscopies and XPS analysis.