

CURRICULUM VITAE

Dr. Pablo Albella

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EDUCATION

- **Ph.D. in Applied Physics** (awarded with the prize of best physics thesis of the year) from the University of Cantabria, Spain, 2009.
- **Master in Education from the** University of Cantabria, Spain, 2006.
- **MSc in Instrumentation and Analytical Science**, from the University of Manchester, UK, 2003.
- **Master Degree in Physics**, from the University of Cantabria, 2002 (*Final year as Erasmus Fellow in the University of Manchester, UK*).

PROFILE

His research interests and activities are mainly devoted to the fields of nanophotonics and materials science. In particular he focuses on the design, characterization, modelling and innovation of photonic structures (plasmonic and non-plasmonic) to enhance the light-matter interaction along different spectral regimes (from optical to microwave passing by the infrared). He aims not only to give new light to the electromagnetic understanding and applications of plasmonic nanoantennas but also to open new fascinating possibilities in the field, with new nanostructures made of dielectric materials which avoid resistive losses, present inherently in metals.

His scientific career features over 40 publications with more than 1200 citations, an h-index of 18 and an i10 index of 24 according to GS (May 2016). Additionally, he is author of 2 book chapters and over 80 contributions in International conferences, workshops or invited seminars. Dr. Albella is also active reviewer of more than 20 scientific journals (Nano Letters, ACS Nano, ACS Photonics, Scientific Data, J. Appl. Physics, Optics Express, Optics Letters, Optics Communications, JOSA A, JOSA B, JQSRT among others), guest editor of special issue in Journal of Nanotechnology, and international referee and advisor of USA Scientific Projects.

EMPLOYMENT HISTORY

- Jan 2013 – Now. **Senior Research Associate** (Imperial College London, UK). Department of Physics, member of Centre for Plasmonics and Metamaterials and Experimental Solid State Physics Group.
- April 2010 – Dec 2012. **Postdoctoral FP7 Fellow** (Material Physics Centre and Donostia International Physics Centre (CSIC-DIPC/UPV)).
- April 2010 – Jan 2013. **Guest Researcher** (CIC Nanogune, San Sebastian, Spain).
- Aug 2009 – Nov 2009. **Research Assistant** (Department of Applied Physics. Univ. of Cantabria, Spain).
- Aug 2005 – Jul 2009. **PhD FPI Fellow** funded by the Spanish Ministry of Education and Science (FPI programme) in the Applied Physics Department at the University of Cantabria, Santander, Spain.

SCIENTIFIC CONTRIBUTIOS

1. J. Canet-Ferrer, **P. Albella**, A. Ribera, J. V. Usagre and S. A. Maier. Hybrid magnetite-gold nanoparticles as bifunctional magnetic-plasmonic systems. (**about to be submitted to ACS Nano**)
2. T. Shibanuma, **Pablo Albella** and Stefan A. Maier. Unidirectional light scattering with high efficiency at optical frequencies based on low-loss dielectric nanoantennas. (**Nanoscale, just accepted**).
3. Kevin J. Freedman, Colin R. Crick, **Pablo Albella**, Avijit Barik, Aleksandar P. Ivanov, Stefan A. Maier, Sang-Hyun Oh, Joshua B. Edl. On-Demand Enhancement of Surface- Enhanced Raman Spectroscopy Using

- Dielectrophoresis and Nanopipettes. **ACS Photonics**, 2016, Article ASAP, DOI: 10.1021/acsp Photonics.6b00119
4. Zhijie Ma, Stephen M. Hanham, **Pablo Albella**, Binghao Ng, Lu Hsiao, Tzu, Yandong Gong, Stefan A. Maier and Minghui Hong. Terahertz All-Dielectric Magnetic Mirror Metasurfaces. **ACS Photonics**, 2016, Article ASAP, DOI: 10.1021/acsp Photonics.6b00096
 5. F. Della Picca, R. Berte, M. Rhamani, **P. Albella**, J. M. Bujjamer, M. Poblet, E. Cortés, Stefan A. Maier, Andrea V. Bragas. Tailored hypersound generation in single plasmonic nanoantennas. **Nano Letters** **16** (2), 1428-1434, (2016)
 6. **Pablo Albella** and **T. Shibanuma (equally contributed)** and Stefan A. Maier. Switchable directional scattering of electromagnetic radiation with subwavelength asymmetric silicon dimers. **Scientific Reports** **5**, 18322 (2015)
 7. S. A. Camacho, P. H. B. Aoki, **P. Albella**, Osvaldo N. Oliveira Jr., C. J. L. Constantino and R. F. Aroca. **J. Phys. Chem C. (Accepted Nov 2015, Article ASAP DOI: 10.1021/acs.jpcc.5b09215).**
 8. M. Caldarola, **P. Albella**, E. Cortés, M. Rahmani, T. Roschuk, G. Grinblat, R. Oulton, Andrea V. Bragas and Stefan A. Maier. **Nature Comms** **6:7915**, (2015)
 9. A. Rakovich, **P. Albella** and Stefan. A. Maier. **ACS Nano** **3**, 2648–2658, (2015).
 10. **C. R. Crick, P. Albella (equally contributed)**, B. Ng, A.P. Ivanov, T. Roschuk, M.P. Cecchini, F. Bresme, S. A. Maier and J.B. Edel. **Nano Letters** **15**(1), 553–9 (2014).
 11. I.O. Osorio-Román, A. R. Guerrero, **P. Albella** and R.F. Aroca. Plasmon enhanced fluorescence with aggregated shell-isolated nanoparticles. **Analytical Chemistry** **86** (20), 10246–51, (2014).
 12. **P. Albella**, R. Alcaraz de la Osa, F. Moreno and S. A. Maier. Electric and Magnetic Field Enhancement with Ultralow Heat Radiation Dielectric Nanoantennas: Considerations for Surface-Enhanced Spectroscopies. **ACS Photonics**, **1** (6), 524–529, (2014).
 13. **P. Albella**, A. Poyli, M. K. Schmidt, S.A. Maier, F. Moreno, J.J. Saenz and J. Aizpurua, “Low-Loss Electric and Magnetic Field-Enhanced Spectroscopy with Subwavelength Silicon Dimers”, **J. Phys. Chem. C** **117**, 13573–13584 (2013).
 14. F. Moreno, **P. Albella** and M. Nieto-Vesperinas, “Analysis of the spectral behavior of localized plasmon resonances in the near- and far-field regimes”, **Langmuir** **29**, 6715-6721 (2013).
 15. P. Alonso-González, **P. Albella**, F. Neubrech, Christian Huck, J. Chen, F. Golmar, F. Casanova, L. E. Hueso, A. Pucci, J. Aizpurua and R. Hillenbrand, “Experimental Verification of the Spectral Shift between Near- and Far-Field Peak Intensities of Plasmonic Infrared Nanoantennas”, **Phys. Rev. Letters** **110**, 203902 (2013).
 16. P. Alonso-González, **P. Albella**, F. Golmar, L. Arzubiaga, F. Casanova, L. E. Hueso, J. Aizpurua and R. Hillenbrand, “Visualizing the near-field coupling and interference of bonding and anti-bonding modes in infrared dimer nanoantennas”, **Optics Express** **21**, 1270-1280, (2013).
 17. G. Mouna, R. Rodriguez-Oliveros, **P. Albella**, J. A. Sanchez-Gil and R.F. Aroca. “Plasmonics and single-molecule detection in evaporated silver-island films”, **Annalen der Physik** **524**, 697-704 (2012).
 18. J.M. Geffrin, B. García-Cámara, R. Gómez-Medina, **P. Albella**, L.S. Froufe-Pérez, C.Eyraud, A. Litman, R. Vaillon, F. González, M. Nieto-Vesperinas, J.J. Sáenz and F. Moreno, “Zero backward and near-zero forward scattering from a single dielectric subwavelength sphere”, **Nature Comms** **3**, 1171, (2012).
 19. M. Abb, Y. Wang, **P. Albella**, C.H. de Groot, J. Aizpurua and O.L. Muskens, “Interference, Coupling, and Nonlinear Control of High-Order Modes in Single Asymmetric Nanoantennas”, **ACS Nano** **6**, 6462–6470, (2012).
 20. Audrey Berrier, **Pablo Albella**, M. Ameen Poyli, Ronald Ulbricht, Mischa Bonn, Javier Aizpurua and Jaime Gómez Rivas, “Detection of deep-subwavelength dielectric layers at terahertz frequencies using semiconductor plasmonic resonators”, **Opt. Express** **20**, 5052 (2012).
 21. **P. Alonso-González and P. Albella (equally contributed)**, M. Schnell, J. Chen, F. Huth, A. García-Etxarri, F. Casanova, F. Golmar, L. Arzubiaga, L. E. Hueso, J. Aizpurua and R. Hillenbrand, “Resolving the electromagnetic mechanism of surface-enhanced light scattering at single hot spots”, **Nature Comms** **3**, 684 (2012).
 22. **P. Albella**, Borja Garcia-Cueto, Francisco González, Fernando Moreno, Pae C Wu, Tong-Ho Kim, April Brown, Yang Yang, Henry O. Everitt and Gordon Videen “Shape Matters: Plasmonic Nanoparticle Shape Enhances Interaction with Dielectric Substrate”, **Nano Letters** **11**, 3531–3537 (2011).

23. Ricardo F. Aroca, Geok Yi Teo, Haider Mohan, Ariel R. Guerrero, **P. Albella** and Fernando Moreno, "Plasmon-Enhanced Fluorescence and Spectral Modification in SHINEF", **J. Phys Chem C** **115**, 20419–20424 (2011).
24. D. Weber, **P. Albella**, P. Alonso-González, F. Neubrech, H. Gui, T. Nagao, R. Hillenbrand, J. Aizpurua and A. Pucci, "Longitudinal and Transverse coupling in infrared gold nanoantenna arrays: Long range vs short range interaction regimes", **Optics Express** **19**, 15047-15061 (2011).
25. **P. Albella**, F. Neubrech, D. Weber, G. Han, T Nagao, A. Pucci and J. Aizpurua, "Nanoantennas for surface enhanced infrared spectroscopy: Effects of interaction and higher order resonant excitations", **AAPP| Physical, Mathematical, and Natural Sciences** **89**, S1 (2011)
26. P. Alonso-Gonzalez, M. Schnell, P. Sarriugarte, H. Sobhani, C. Wu, N. Arju, A. Khanikaev, F. Golmar, **P. Albella**, L. Arzubiaga, F. Casanova, L. E. Hueso, P. Nordlander, G. Shvets, R. Hillenbrand, "Real-Space Mapping of Fano Interference in Plasmonic Metamolecules", **Nano Letters** **11**, 3922–3926 (2011).
27. **P. Albella**, J. M. Saiz, F. González and F. Moreno, "Surface Monitoring based on light scattering by metal Nanosensors", **Invited Review in Journal of Quantitative Spectroscopy & Radiative Transfer** **112**, 2046-2058, (2011).
28. J. Chen, **P. Albella**, Z. Pirzadeh, F. Huth, P. Vavasori, A. Dimitrev, J. Aizpurua and R. Hillenbrand, "Plasmonic Nickel Nanoantennas", **Small** **7**, 2265 (2011) (**Issue Cover**).
29. M. Abb, **P. Albella**, J. Aizpurua and O. Muskens, "All-optical control of a single plasmonic nanoantenna-ITO hybrid", **Nano Letters** **11**, 2457-2463 (2011).
30. **P. Albella**, F. Moreno, J.M. Saiz and F. González. "Detection and Characterization of Nano-defects located on Micro-Structured substrates by means of light scattering.", Wave Propagation, ANDREY PETRIN INTECH (ED.), 2011.
31. R. Paniagua-Dominguez, J. A. Sánchez-Gil, **P. Albella**, J.M. Saiz, F. González and F. Moreno, "Enhanced backscattering of electromagnetic waves from randomly rough gratings on negative magnetic metamaterials", **Metamaterials** **4**, 201-206 (2010).
32. R. Alcaraz de la Osa, **P. Albella**, J.M. Saiz, F. González and F. Moreno, "Extended discrete dipole approximation and its application to bianisotropic media", **Opt. Express** **18**, 23865-23871 (2010).
33. B. Setién, **P. Albella**, J.M. Saiz, F. González and F. Moreno, "Spectral behaviour of the linear polarization degree at right- angle scattering configuration for nanoparticle systems", **New Journal of Physics** **12**, 103031 (2010).
34. F. Moreno, **P. Albella**, F. González and B. García-Cámara, "Fundamentos de Espectroscopía Plasmónica con Nanopartículas metálicas. Plasmónica sobre nanoestructuras metálicas", P. Sevilla (ED.), Sociedad Española de Óptica, (2010).
35. J. M. Sanz, **P. Albella**, F. González, J.M. Saiz, F. Moreno, "Polar Decomposition of Mueller Matrices for 2D-Structured Surfaces", **EPJ Web of conferences** **5**, 04006 (2010).
36. **P. Albella**, J.M. Saiz, J.M. Sanz, F. González and F. Moreno, "Nanoscope Surface characterization by analyzing the linear polarization degree of the scattered light", **Optics Letters** **34**, 1906-1909 (2009).
37. J.M. Sanz, **P. Albella**, F. Moreno, J.M. Saiz and F. González, "Application of the Polar Decomposition Method to Particle Scattering Systems" **Journal of Quantitative Spectroscopy & Radiative Transfer** **110**, 1369–1374 (2009).
38. **P. Albella**, F. Moreno, J.M. Saiz and F. González, "Surface inspection by monitoring spectral shifts of localized plasmon resonances", **Optics. Express**, **16**, 12872 (2008).
39. **P. Albella**, F. Moreno, J.M. Saiz and F. González. "Influence of the substrate optical properties on the backscattering of contaminated microstructures", **Journal of Quantitative Spectroscopy & Radiative Transfer** **109**, 1339-1346 (2008).
40. Jaime A. Sanchez, M. Pinar Menguc and **P. Albella**. "Study of Electron Trajectories during Field Emission from a CNT", **Journal of Applied Physics**, **101** 114313 (2007).
41. **P. Albella**, F. Moreno, J.M. Saiz and F. González. "Characterization of the optical properties of small defects on microstructures located on flat substrates", **Opt. Express** **15**, 6857-6867 (2007).
42. **P. Albella**, F. Moreno, J.M. Saiz and F. González. "Double interaction model applied to small particles contaminating microstructures located on substrates", **Journal of Quantitative Spectroscopy & Radiative Transfer** **106**, 4-10 (2007).
43. **P. Albella**, F. Moreno, J.M. Saiz and F. González. "Monitoring small defects on surface microstructures

through backscattering measurements”, **Optics Letters** **31**, 1744-1746 (2006)

CONFERENCES, SCHOOLS AND WORKSHOPS

Over 30 oral contributions/seminars(more than half of them as invited) and over 80 poster presentations in international conferences.

FELLOWSHIPS & POSITIONS

- **2013-Now:** Senior Research Associate (Imperial College London)
- **2010-2013:** Postdoctoral FP7 European fellowship.
- **2006-2009:** Several Research Fellowships for short stays abroad awarded by the Spanish Ministry of Science and Education.
- **2005-2009:** PhD fellowship by the Spanish Ministry of Science and Education.
- **2004-2005:** SEPI Foundation Fellowship in Madrid
- **2002-2003:** EPSRC Master fellowship in Manchester (UK)
- **2001-2002:** Erasmus fellowship in Manchester (UK).

RESEARCH PRIZES

- **2015:** Nominated to the Small Young Innovator Award (National Centre for Nanoscience and Technology, China and Wiley-VCH).
- **2015:** Award of active and distinguished reviewer of OSA.
- **2012:** Research Prize of the “Consejo Social of Cantabria”.
- **2011:** Finalist of Young Scientist Award from Elsevier.
- **2010:** Best PhD Thesis Award.
- **2008:** 2nd Best Scientific Publication of the year at University of Cantabria
- **2007:** Best Scientific Publication of the year at University of Cantabria

INVITED STAYS IN INTERNATIONAL RESEARCH CENTRES

- **Jan - Feb 2012:** Dept. of Physics and Astronomy, University of Southampton (UK).
- **Dec 2009 - April 2010:** Army Research Lab, Adelphi, Maryland (USA).
- **Feb - May 2009:** University of Windsor (Canada). Materials and Surface Science Group (MSSG), Department of Chemistry and Biochemistry.
- **May - Aug 2008:** Madrid (Spain). Department of Vibrational Spectroscopy and Multiphotonic Processes, CSIC.
- **May - August 2007:** University of Nottingham (UK), Department of Material Science.
- **June - August 2006:** University of Kentucky (USA), Department of Mechanical Engineering, RTL lab.

PARTICIPATION IN FUNDED PROJECTS

- **2014-2016:** “Dielectric nanoantennas: exploration of a new low-loss nanophotonics Platform” by The Leverhulme Trust (UK).
- **2011-2015:** “Metamaterials and the Control of Electromagnetic Fields” by The Leverhulme Trust (UK).
- **2013-2014:** “Design and Optimization of electromagnetic metamaterials” by German Research Foundation (DFG).
- **2010-2013:** “Propiedades electrónicas y reactividad de Sistemas Complejos”. Project funded by Spanish Ministry of Science and Innovation.
- **2009-2012:** “Nanoantenna project”. Fondo Económico Europeo, HEALTH- FS-2009-241818.

- **2010-2011:** “Light Scattering of Nano-particles deposited on Substrates: A Numerical Study though the DDA method”. Project funded by USAIT-C.
- **2007-2010:** “Estadística de la luz difundida por nanopartículas metálicas en suspensión. Influencia de resonancias plasmónicas y difusión multiple. Desarrollo de técnicas para obtener información del difusor”, Project funded by Spanish Ministry of Science and Innovation.
- **2008-2009:** “Interaction of Metallic Nano-Particles with Substrates. Applications to Optical Microscopy with Nano-probes”. Project funded by USAIT-C.
- **2004-2007:** “Caracterización polarimétrica de microestructuras. Aplicaciones en Astrofísica y Monitorización de Contaminantes”, Project funded by Spanish Ministry of Science and Innovation.

TEACHING EXPERIENCE

- Accredited as “University Lecturer in Spain” by ANECA
- **University Teaching Assistant for more than 6 years** in undergraduate and postgraduate courses (optics, electromagnetism, computational physics, ...)
- **Co-supervisor** of 2 PhD thesis and several master students.

OTHER SCIENCE-RELATED ACTIVITIES

- **Active scientific divulgator** (Speaker and Co-organizer of Pint of Science 2016 in London: <https://pintofscience.co.uk/event/light-matter-and-everything-in-between> and speaker and co-organizer of the scientific week at Holy Christ School in 2016)
- **Research Associate representative** at Imperial College London (2013-2014).
- **Member of PhD viva Committee** (June 2013 and July 2015).
- **Refereeing activity:** Nano Letters, ACS Nano, ACS Photonics, APL, JOSA A, JOSA B, J. Appl. Physics, Optics Express, Optics Letters, J.Phys. D, Optics Communications, Journal of Quantitative Spectroscopy & Radiative Transfer among others. (2009-Now)
- **PhD Students and teaching assistant representative** at University of Cantabria (2008-2009)