

# Beatriz Santiago González – *Curriculum vitae*



**Name:** Beatriz Santiago González

**Email:** [beagoldcluster@gmail.com](mailto:beagoldcluster@gmail.com)

**Nationality:** Spanish

**Telephone:** 0034 653240322

## ACADEMIC BACKGROUND

- Doctorate in Chemistry (PhD). Nanomag laboratory. Faculty of Chemistry. University of Santiago de Compostela (Spain). Grade: *First Cum Laude*. Supervisor: M. A. López-Quintela. December 2012.
- Diploma of Advanced Studies University of Santiago de Compostela (Spain). September 2009.
- BSc in Chemistry (Licenciado). University of Santiago de Compostela (Spain). July 2006.

## CURRENT POSITION

01/09/2018-Present. **Marie Curie COFUND Research Fellow**, Ultrafast Bio- and Nanophotonics group, Nanophotonics Department. International Iberian Nanotechnology Laboratory. Braga (Portugal)

**Project:** Synthesis and experimental investigation of the optical properties of fluorescent colloidal nanomaterials for their application in biomedical theranostics

**Supervisor:** Jana B. Nieder

## PAST POSITIONS AND RESEARCH EXPERIENCE

- 01/10/2017-31-08-2018. **Postdoctoral Researcher**, Bioengineering Institute of Technology. Universitat Internacional de Catalunya. Barcelona (Spain)  
**Project:** Multimodal nanoparticles for advanced application in Regenerative Medicine.  
**Supervisor:** Roman Pérez Antoñanzas.  
**Responsibilities:** Establish a new research line in the field of multimodal nanoparticles as new smart delivery vehicles for regenerative medicine.  
**Acquired Skills:** Self-assembled colloidal nanoparticles desing. Toxicity. Application in nanomedicine/generative medicine.
- 01/06/2013-30-09-2017. **Postdoctoral Researcher**, Dept. of Materials Science, University of Milano-Bicocca, Milano, Italy.  
**Project:** Development of new disruptive methods by rational combination of property-designed nanochemistry routes and surface engineered strategies for obtaining colloidal atomic metal clusters and multifunctional nanomaterials with novel functionalities.  
**Supervisor:** Sergio Brovelli  
**Responsibilities:** Set up a new research line in the field of multimodal nanoparticles for energy, sensors and bioimaging.  
**Acquired Skills:** Synthesis and surface design strategies of colloidal semiconductor quantum dots and metal clusters. Optical spectroscopy studies.
- 12/12/2012 – 01/06/2013 **Postdoctoral Researcher**, Nanomag group, Physical Chemistry Department, University of Santiago de Compostela. Santiago de Compostela (Spain)  
**Supervisor:** M. A. López-Quintela.  
**Acquired Skills:** Synthesis and bioconjugation techniques of metal nanoparticles. Sensoring.

• 01/05/2007 – 12/12/2012

- **PhD Scholar**, Nanomag group, Physical Chemistry Department, University of Santiago de Compostela.
- **Researcher and advisor of technology transfer**, Spin-off company NANOGAP –subnanometer powders-(<http://www.nanogap.es/>) from the University of Santiago de Compostela.

Supervisor: M. A. López-Quintela.

Project: Multiparameter sensing for high sensitivity diagnostics using fluorescent and magnetic nanoparticles (FLUOROMAG: UE-FP6 (No.037465 FLUOROMAG.103).

Responsibilities: Synthesis and bioconjugation techniques of metal nanoparticles.

Acquired Skills: Colloidal chemistry and nanochemistry routes for the synthesis of metal quantum clusters and nanoparticles. Optical characterization techniques (absorption and photoluminescent properties), structural characterization (mass spectrometry, transmission electron microscopy, X-ray photoelectron spectroscopy (XPS) analysis, atomic force microscopy (AFM) and transmission electron microscopy (TEM).

## RESEARCH STAYS AND COLLABORATIONS

**2014-** Research stay. Italian Institute of Technology (iit). Genova, Italy (1 month). Prof. Liberato Manna. *X-ray Photoelectron spectroscopy and High resolution Transmission electron microscopy (HRTEM)*

**2010-** Research stay. Institute of Nanoscience and Nanotechnology. Lisbon, Portugal (1 month). Prof. José Gaspar Martinho. *Time-resolved picoseconds fluorescence measurements.*

**2009-** Research stay. Institute of Microelectronics of Barcelona IMB-CNM. Barcelona, Spain (1 month). Prof. Andreu Llobera Adàn. *Integrated optic devices and photonic lab on a chip.*

**2008-** Research stay. Nanobiophysics group, University of Twente. Enschede, Netherlands (1 month). Prof. Vinod Subramaniam. *Time-resolved picoseconds fluorescence measurements.*

## PUBLICATIONS

11. “*Bottom-up Synthesis and Self-Assembly of Copper Clusters into Permanent Excimer Supramolecular Nanostructures*”. **Santiago González, B.**; Monguzzi, A; Capitani, C.; Prato, M.; Santambrogio, C.; Meinardi, F. and Brovelli, S. – **Angew. Chem. Int. Ed.**, 2018, 57, 7051-7055.

10. “*Self-Assembled pH-sensitive fluoromagnetic nanotubes as archetype system for multimodal imaging of brain cancer*”. Villa, C.; Campione, M.; **Santiago González, B.**; Alessandrini, F.; Erratico, S.; Zucca, I.; Burzzone, M. G.; Forzenigo, L.; Malatesta, P.; Mauri, M.; Trombetta, E.; Brovelli, S.; Torrente, Y.; Meinardi, F. and Monguzzi, A.– **Adv. Funct. Mater.**, 2018, 28, 1707582.

9. “*Metal Nanoclusters with Synergistically Engineered Optical and Buffering Activity of Intracellular Reactive Oxygen Species by Compositional and Supramolecular Design*” **Santiago González, B.**; Monguzzi, A; Caputo, M.; Villa, C.; Prato, M.; Santambrogio, C.; Torrente, Y.; Meinardi, F. and Brovelli, S. – **Scientific Reports**, 2017, 7: 5976.

8. “*“Quantized” doping of individual colloidal nanocrystals using size-focused metal quantum clusters*”. **Santiago González, B.**; Monguzzi, A.; Pinchetti, V.; Casu, A.; Prato, M.; Lorenzi, R.; Campione, M.; Chiodini, N.; Santambrogio, C.; Meinardi, F ; Manna, L. and Brovelli, S. – **ACS Nano**, 2017, 11 (6), 6233–6242.

7. “*Two-color emitting colloidal nanocrystals as single particle ratiometric probes of intracellular pH*”. Bruni, F.; Pedrini, J.; Bossio, C.; **Santiago González, B.**; F.; Meinardi, F.; Bae, W. K.; Klimov, V.; Lanzani, G. and Brovelli, S – **Adv. Funct. Mater.**, 2017, 27 (12), 1605533.

6. “*Permanent excimer superstructures by supramolecular networking of metal quantum clusters*”. **Santiago González, B.**; Monguzzi, A.; Azpiroz, J. M; Prato, M.; Erratico, S.; Campione, M.; Lorenzi, R.; Pedrini, J.; Santambrogio, C.; Torrente, Y.; De Angelis, F.; Meinardi, F. and Brovelli, S. – **Science**, 2016, 353, 571-575.

**This article was highlighted in Ang. Chem. Int. Ed.** by “*Metal-Cluster-Based Colloidal Excimer Superstructures*”. Zhang, Z. and Ren, S. – **Ang. Chem. Int. Ed.**, 2016, 55 (51), 15708-15710.

5. "Surface Polarization Drives Photoinduced Charge Separation at the P3HT/Water Interface". Mosconi, E.; Salvatori, P.; Saba, M. I.; Mattoni, A.; Bellani, S.; Bruni, F.; **Santiago González, B.**; Antognazza, M. R.; Brovelli, S.; Lanzani, G.; Li, H.; Brédas, J-L and De Angelis, F. - **ACS Energy Lett.**, 2016, 1 (2), 454–463
4. "Synthesis of water-soluble gold clusters in nanosomes displaying robust photoluminescence with very large Stokes shift" **Santiago-González, B.**; Vázquez-Vázquez, C.; Blanco-Varela, M. C.; Gaspar-Martinho, Ramallo-López, J. M.; Requejo, F. G.; López-Quintela, M. A. **Journal of Colloid and Interface Science**, 2015, 455, 154–162.
3. "Electrochemical control of two-color emission from colloidal dot-in-bulk nanocrystals" Brovelli, S; Bae, W. K.; Meinardi, F; **Santiago-González, B.**; Lorenzon, M.; Galland, C. and Klimov, V. I. **Nano Letters**, 2014, 14, 3855-3863. (Impact factor: 13.592; citations: 18)
2. "Single step electrochemical synthesis of hydrophilic/hydrophobic Ag<sub>5</sub> and Ag<sub>6</sub> blue luminescent clusters" **Santiago González, B.**; Blanco, C.; López-Quintela, M. A. **Nanoscale**, 2012,4, 7632-7635.
1. "One Step Synthesis of the Smallest Photoluminescent and Paramagnetic PVP-Protected Gold Atomic Clusters" **Santiago González, B.**; Rodríguez, M. J.; Blanco, C.; Rivas, J.; López-Quintela, M. A.; Gaspar-Martinho, J. M. **Nano Letters**, 2010, 10, 4217-4221. (Impact factor: 12.186; citations: 127)

## RESEARCH MONOGRAPHS, CHAPTERS IN COLLECTIVE VOLUMES AND ANY TRANSLATIONS THEREOF.

2. "New strategies and synthetic routes to synthesize fluorescent atomic quantum clusters" **Santiago-González, B.** and López-Quintela, M. A, in "Functional Nanometer-Sized Clusters of Transition Metals: Synthesis, Properties and Applications", **RSC Smart Materials Series, Royal Society of Chemistry**. 2014, ISBN: 978-1-84973-824-8.
1. "Composite functional nanomaterials assembled via electrostatic interactions of inorganic surfaces and organic molecules" Campione, M.; Monguzzi, A.; **Santiago González, B.**; Vila, C.; Bruzzone, M. G. –**Encyclopedia of Interfacial Chemistry –Encyclopedia of Interfacial Chemistry - Surface Science and Electrochemistry, Elsevier**, 2017; ISBN: 9780128097397.

## INVITED PRESENTATIONS TO CONFERENCES

15 poster and 5 oral presentations in national and international conferences.

### Selected conference presentations

**Nanotech France 2017.** *Permanent excimer superstructures by supramolecular networking of metal quantum clusters.*

Paris (France). June 28-30th 2017. *Oral*

**2016 MRS Spring Meeting & Exhibit.** "Self-Standing Excimers at the Single Particle Level by Supramolecular Networking of Metal Quantum Clusters" and "Metal Nanocluster Seeded Growth of Electronic Doped Colloidal Quantum Dots in Water."

Phoenix, Arizona (USA). 28th March- 1st April 2016. *Oral presentations.*

**Fourth International Conference on Hybrid Materials.** *Novel colloidal nanostructures for advanced applications in electronics, photonics and biomedical diagnostics.*

Sitges, Barcelona (Spain) March 9–13th 2015. *Oral*

**International Conference on Quantum Dots.** *Room temperature synthesis of water soluble CdS quantum dots assisted by metal cluster seeding.*

Pisa (Italy), May 11-16th 2014. *Oral*

**4th Iberian Meeting on Colloids and Interfaces (RICI4).** *Luminescent Ag clusters synthesized by a simple electrochemical method.*

Porto (Portugal). July 13-15th 2011.

**XIV International symposium on luminescence spectrometry.** *New kind of highly fluorescent materials: gold atom clusters.*

Prague (Czech Republic). July 13-16th 2010.

## **ORGANISATION OF INTERNATIONAL CONFERENCES**

Organization of the following conferences:

- “**International Conference on Quantum Dots**” held in Pisa (Italy), May 11-16th 2014. (Organization committee)
- “**Nanodots&Diagnostics**” held in Santiago de Compostela (Spain) March 27-29th 2009. (Organization committee)
- “**GEFES 2008**” held in Santiago de Compostela (Spain) January 13-15th 2008. (Organization committee)

## **PARTICIPATION IN INDUSTRIAL INNOVATION**

Participation as scientific researcher and advisor of the technology transfer from the Research group Nanomag (University of Santiago de Compostela, Spain) to the Spin-off company *NANOGAP –subnanometer powders-* (<http://www.nanogap.es/>) (Santiago de Compostela, Spain).

*Responsibilities:* Design, synthesis and characterization of luminescent nanomaterials and plasmonic nanoparticles.

## **PRIZES AND AWARDS**

**2001-** Tuition free first academic year at the University of Santiago de Compostela for students who graduated with Honors in high-school, awarded by the Spanish Ministry of Education and Science.

**2005-** Grant to collaborate in University Departments awarded by the Spanish Ministry of Education and Science, Faculty of Chemistry, University of Santiago de Compostela, Spain.

**2006-** Grant as Teaching Assistant for the course “Analytical Chemistry” awarded by the Spanish Ministry of Education and Science, at the Department of Analytical Chemistry, Faculty of Chemistry, University of Santiago de Compostela, Spain.

**2014-** Grant for Teaching Assistant in Physical Chemistry III and Laboratory. Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Italy. (Academic years: 2014/2015, 2015/2016 and 2016-2017)

**2018** – Seal of Excellence from European Commission for a research proposal submitted to *Horizon 2020*.

## **FUNDING RECEIVED (exclusive funding to Beatriz Santiago)**

**2009-** Student fellowship to participate at “2<sup>nd</sup> European Science Foundation Summer School in Nanomedicine” Lisbon, Portugal.

**2011-** Short Term Scientific Mission (STSM) grant COST ACTION CM1001.

**2013-** Tutoring grant, Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Italy.

**2014-** Grant for Teaching Assistant in Physical Chemistry III and Laboratory. Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Italy.

**2015-** Grant researcher from MIUR (Italian Ministry of Instruction, University and Research) as a postdoctoral researcher at the University of Milano-Bicocca, Italy.

**2017-** Grant researcher from Bioengineering Institute of Technology (BIT). Universitat Internacional de Catalunya. Barcelona (Spain)

## SCIENCE DISSEMINATION

- Press release “Nuovi materiali: Le molecole d’oro che vincono l’evanescenza della materia”. Online edition of the journal *Le Scienze* ([http://www.lescienze.it/lanci/2016/08/04/news/universita\\_di\\_milano-bicocca\\_-\\_nuovi\\_materiali\\_le\\_molecole\\_d\\_oro\\_che\\_vincono\\_l\\_evanescenza\\_della\\_materia-3192796/](http://www.lescienze.it/lanci/2016/08/04/news/universita_di_milano-bicocca_-_nuovi_materiali_le_molecole_d_oro_che_vincono_l_evanescenza_della_materia-3192796/))
- European Researchers’ Night 2015. (MeetMeTonight) 25<sup>th</sup> and 26<sup>th</sup> September 2015, Milano.
- Tutoring within the “PROGETTO LAUREE SCIENTIFICHE” in order to disseminate applied research of functional materials among High School students. Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Italy. Academic years: 2013/2014, 2014/2015, 2015/2016 and 2016-2017.

## PARTICIPATION IN RESEARCH PROJECTS

- *Multiparameter sensing for high sensitivity diagnostics using fluorescent and magnetic nanoparticles* (FLUOROMAG: UE-FP6 PROGRAMMA MARCO LIFESCIHEALTH-6 European Programme (No.037465-FLUOROMAG.103). 2006 -2010
- *CLIP (Conductive Low-Cost Ink Project)* (EU-FP7 FRAMEWORK PROGRAM. FP7 EC R4SME Project No. 243557). 2010 -2013
- *Electronic Doped colloidal Nanocrystal Heterostructures for transformational breakthrough in Solid-state lighting* (EDONHIST). (CARIPLO FOUNDATION). 2013-2015
- *Electronic Doped colloidal Nanocrystal Heterostructures with designed Interfacial composition: towards the development of new nano-device concepts for lighting and Energy Technologies* (2012-INTERNAZ-0085). 2014-2017

## SUPERVISING AND TEACHING ACTIVITIES

- Analytical Chemistry Laboratory. Faculty of Chemistry, University of Santiago de Compostela. 2006-2007.
- “Graduate scientific degrees project”, Dept. of Materials Science, University of Milano-Bicocca, Milano, Italy. 2013-2016
- Physical Chemistry III and Laboratory. Dept. of Materials Science, University of Milano-Bicocca, Milano, Italy. 2014-2017
- 6 MSc students supervised (during the last 5 years):

Physical Chemistry Department, University of Santiago de Compostela.

- Patricia Vigo Luna (MSc student, 01/06/2011-31/05/2013)

Dept. of Materials Science, University of Milano-Bicocca, Milano, Italy

- Matteo Caputo (MSc student, 01/09/2013-01/11/2014)
- Eric Fantuzzi (MSc students, 01/03/2016-20/11/2016)
- Elisa Lassi (MSc student, 01/10/2015-20/11/2016)
- Cristina Sandiogni (MSc student, 01/06/2016-20/03/2017)
- Chiara Capitani (MSc student, 01/05/2016-present)

## LANGUAGES

- **Galician:** mother tongue
- **Spanish:** mother tongue
- **English:** *Advanced (B2) by Common European Framework of Reference for Languages.* (2011)
- **Italian:** *Proeficiency (C2). Certificazione di Italiano come Lingua Straniera (CILS) by Foreigners University of Siena* (2015)

## SKILLS AND TECHNIQUES

- Nanochemistry and colloidal synthesis (top-down and bottom-up approaches) of metal quantum clusters, small nanoparticles, self-assembled nanoparticles and semiconductor quantum dots.
- Optical spectroscopy (steady state measurements, time-resolved photoluminescence and optical absorption)
- Mass spectrometry (ESI, LDI, MALDI-TOF)
- X-ray photoelectron spectroscopy (XPS) analysis
- Atomic force microscopy (AFM)
- Transmission electron microscopy (TEM)

For obtaining **REFERENCES** about Beatriz Santiago González, you can contact with:

- Prof. Sergio Brovelli  
Dipartimento Scienza dei Materiali.  
Via Roberto Cozzi, 55.  
Università degli Studi di Milano- Bicocca.  
sergio.brovelli@unimib.it  
Tel. 00390264485027
- Prof. Liberato Manna  
Director, Nanochemistry Department  
Italian Institute of Technology  
Via Morego 30, Genova 16163, Italy  
Email: liberato.manna@iit.it  
Tel.: +39 010 71781502  
  
Professor of Quantum Nanoscience and Chemical Engineering  
Delft University of Technology  
PO box 5, 2600AA, Delft, The Netherlands
- Prof. M. Arturo López-Quintela  
Dept. Physical Chemistry,  
Faculty of Chemistry  
Lab of Nanotechnology and Magnetism (NANOMAG)  
Research Technological Institute  
University of Santiago de Compostela  
E-15782 Santiago de Compostela, Spain  
[malopez.quintela@usc.es](mailto:malopez.quintela@usc.es)  
Tel. +34-881813044

- Prof. M. Yvan Torrente  
Director at Stem Cell Laboratory and Professor  
Dipartimento di Scienze Neurologiche  
Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico  
Via Francesco Sforza 35  
20122 MILANO  
ITALY  
yvan.torrente@gmail.com  
Phone: +39 02 55033874