Diana Serrano García

CNRS researcher at IRCP - Chimie ParisTech

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Birthday:
March 4, 1985

Place:
Salinas, Asturias

Nationality
espagnole

Current situation

December 2016 - Present

Chargée de recherche CNRS à l'*Institut de Recherche de Chimie Paris (IRCP)* - ENSCP Chimie ParisTech - PSL University.

Experience

April 2014 - November2016
Postdoctoral research fellow at University of Zürich (Switzerland)
Chemistry department - Pr. Stefan Seegers's goup.

October 2013 - March 2014
Postdoctoral research fellow at Lund University (Sweden) - Atomic physics division - Quantum Information Group - LLC Linnaeus grant.

Octubre 2012 - Octubre 2013
Postdoctoral research fellow at Lund University (Sweden) - Atomic physics division - Quantum Information Group - ITN Marie Curie funding.

Education

2009 - 2012
PhD in Physics - Optics and materials - at *Centre de Recherche sur les Ions les Matériaux et la Photonique (CIMAP)*. Université de Caen-Basse Normandie (France). Thesis title: "Quantum Cutting Processes in Rare-earth doped fluorides for Photovoltaic applications". Supervisors: Dr. Alain Braud and Pr. Dr. Richard Moncorgé.

2003 - 2009
5-year degreew in Physics (Master equivalent) - University of Salamanca.

2003 - 2008
Bachelor of Arts in Piano. High conservatory of music of Castilla y León.

Other trainings
2009 - 2011
Scientific careers and management (84h). Institut d'Administration d'Entreprises (IAE) - University of Caen.-Basse Normandie.

Other professional activities

Teaching

Teaching at the University of Zürich (Switzerland):
- Digital electronics, LabView (150h).

Teaching at Lund University (Sweden):
- Digital Imaging (20h).
- Matlab for beginners (14h).
- Medical Optics Lab: Fluorescence in Biological Media (12h).
- Master thesis supervision (Juin-Décembre 2013).

Teaching at University of Caen-Basse Normandie:
- Thermodynamique physique (29h).
- Physique expérimentale (18h).
- Travaux pratiques en physique nucléaire et de particules (20h).

Scientific management

- Coordinator (PI) - MIRESPIN project: Microwave - rare-earth photon spin interfaces (PRC ANR project 2020-2023 - 430 k€.).
- Project Manager (PM) - NanOQTech project: Nanoscale systems for optical quantum technologies (GA no. 712721 - EU project 2016-2019 - 3.38 M€.).
- Participation in international scientific committees:
  - Conférence QTech 2020 - Barcelona
  - Conférence Optique Toulouse 2018
  - Conférence Optique Dijon 2020.
- Member of the National Committee of Scientific Research (CoNRS).
- Reviewer for peer-reviewed journals including Nature, PRL, PRA, PRB, N. J Phys...

Languages

- spanish: mother language.
- english: full professional proficiency.
- french: bilingual proficiency.

Certificates:

DALF C2 (Diplôme Approfondi en Langue Française). Score 89/100.

Software knowledge

- Microsoft Office, Latex, Microcal Origin.
- Comsol Multiphysics.
- Design 3D: SolidWorks, CAD.
- Matlab, Mathematica, C, Labview.

Scientific production

h-index: 11

i10-index: 12

citations: 330

Peer-reviewed publications

1. N Harada, A Tallaire, **D. Serrano**, A Seyeux, P Marcus, X Portier, C Labbé, P Goldner, A Ferrier, "Controlling the interfacial reactions and environment of rare-earth ions in thin oxide films towards wafer-scalable quantum technologies", Materials Advances (2021).

2. K. S. Kumar, **D. Serrano**, A. N. Nonat, B. Heinrich, L. karmazin, L. J. Charbonnière, P. Goldner, M. Ruben, "Optical spin-state polarization in a binuclear europium complex towards molecule-based coherent light-spin interfaces", Nature Communications 12, 1 (2021).

3. B. Casabone, C. Deshmukh, S. Liu, **D. Serrano**, A. Ferrier, T. Hümmer, P. Goldner, D. Hunger et H. de Riedmatten, "Dynamic Control of Purcell Enhanced Emission of Erbium Ions in Rare-earth Nanoparticles" Nature Communications 12 (1), 1-7 (2021).

4. A. Ferrier, N. Harada, M. Scarafagio, E. Briand, J-J. Ganem, I. Vickridge, A. Seyeux, P. Marcus, **D. Serrano**, P. Goldner, A. Tallaire, "Harnessing Atomic Layer Deposition and Diffusion to Spatially Localize Rare-Earth Ion Emitters", The Journal of Physical Chemistry C 124 (36), 19725 (2020).

5. A. Fossati, S. Liu, J. Karlsson, A. Ikesue, A. Tallaire, A. Ferrier, **D. Serrano**, P. Goldner, "A Frequency-Multiplexed Coherent Electro-Optic Memory in Rare Earth Doped Nanoparticles", Nano Letters 20 (10), 7087-7093 (2020).

6. S. Liu, A. Fossati, **D. Serrano**, A. Tallaire, A. Ferrier, P. Goldner, "Defect engineering for quantum grade rare-earth nanocrystals", ACS Nano 14 (8) (2020), 9953-9962.

7. N. Harada, A. Ferrier, **D. Serrano**, M. Persechino, E. Briand, R. Bachelet, I. Vickridge, J-J. Ganem, P. Goldner, A. Tallaire, "Chemically vapor deposited Eu^{3+}: Y_2O_3 thin films as a material platform for quantum technologies", Journal of Applied Physics 128 (5) (2020), 055304.

8. M. Scarafagio, A. Tallaire, M-H. Chavanne, M. Cassir, A. Ringuedé, **D. Serrano**, P. Goldner, A. Ferrier, "Improving the Luminescent Properties of Atomic Layer Deposition Eu:Y_2O_3 Thin Films through Optimized Thermal Annealing", Physics Status Solidi a 217 (8) (2020), 1900909.

9. M. Scarafagio, A. Tallaire, K.J. Tielrooij, D. Cano, A. Grishin, M-H. Chavanne, F. H. L. Koppens, A. Ringuedé, M. Cassir, **D. Serrano**, "Ultra-Thin Eu and Er Doped Y2O3 Films with Optimized Optical Properties for Quantum Technologies", The Journal of Physical Chemistry C 123 (21) (2019), 13354–13364.

10. "Structure Analysis of Amyloid Aggregates at Lipid Bilayers by Supercritical Angle Raman Microscopy", V. Dubois, **D, Serrano**, X. Zhang, S. Seeger, Analytical Chemistry 92 (7) (2020), 4963.

11. "Improving the luminescent properties of atomic layer deposition Eu^{3+}:Y_2O_3 thin films through optimized thermal annealing", M. Scarafagio, A. Tallaire, M-H. Chavanne, M. Cassir, A. Ringuedé, **D. Serrano**, P. Goldner, A. Ferrier, Physica Statutus Solidi a 217 (8), (2020), 1900909.

12. "Coherent optical and spin spectroscopy of nanoscale Pr^{3+}:Y_2O_3", **D. Serrano**, C. Deshmukh, S. Liu, A. Tallaire, A. Ferrier, P. Goldner, Physical Review B 100 (14) (2019), 144304.

13. "Amyloid-β Peptide-Lipid Bilayer Interaction investigated by Supercritical Angle Fluorescence", V. Dubois, **D. Serrano**, S. Seeger, ACS Chemical Neurosciences (2019).

14. "Ultra-Thin Eu and Er Doped Y_2O_3 Films with Optimized Optical Properties for Quantum Technologies", M. Scarafagio, A. Tallaire, K-J. Tielrooij, D. Cano, A. Grishin, M-H. Chavanne, F. H. L. Koppens, A. Ringuedé, M. Cassir, **D. Serrano**, P. Goldner, A. Ferrier, Journal of Physical Chemistry C 123 (21) (2019).

15. "All-optical control of long-lived nuclear spins in rare-earth doped nanoparticles", **D. Serrano**, J. Karlsson, A. Fossati, A. Ferrier, P. Goldner, Nature Communications 9 (1)(2018), 2127.

16. "Controlled size reduction of rare-earth doped nanoparticles for optical quantum technologies", S. Liu, **D. Serrano**, A. Fossati, A. Tallaire, A. Ferrier, P. Goldner, RCS Advances 8, 65 (2018).

17. "Supercritical angle Raman microscopy: a surface-sensitive nanoscale technique without field enhancement", **D. Serrano**, S. Seeger, Light Sciences and Applications 6, e17066 (2017).

18. "High-resolution transient and permanent spectral hole burning in Ce^{3+}:Y_2SiO_5 at liquid helium temperatures", J. Karlsson, A. N. Nilsson,
D. Serrano, A. Walther, A. Ferrier, P. Goldner, L. Rippe, S. Kröll, Physical Review B 93 (224304)(2016).

19. "Satellite line mapping in Eu^{3+}-Ce^{3+} and Pr^{3+}-Ce^{3+} codoped Y_2SiO_5", **D. Serrano**, J. Karlsson, L Zheng, Y Dong, A Ferrier, P Goldner, A. Walther, L. Rippe, S. Kröll, Journal of luminescence 170 102 (2016).

20. "High fidelity readout scheme for rare-earth solid state quantum computing", A. Walther, L. Rippe, Y. Yang, J. Karlsson, **D. Serrano**, A. Nilsson, S. Kr$\acute{}$oll, Physical Review A 92 (022319) (2015).

21. "Impact of the ion-ion energy transfer on quantum computing schemes in rare-earth doped solids", **D. Serrano**, Y. Yan, J. Karlsson, L. Rippe, A. Walther, S. Kröll, A. Ferrier, P. Goldner., Journal of luminescemce 151, 93 (2014).

22. "Two-step quantum cutting efficiency in Pr^{3+}-Yb^{3+} codoped KY_3F_{10}", **D. Serrano**, A. Braud, J-L Doualan, W. Bolanos, R. Moncorgé and P. Camy, Physical Review B 88 (20), 205144 (2013).

23. "Pr^{3+} clusters management in CaF_2 by codoping with Yb^{3+} or Lu^{3+} for visible laser and solar down-converters applications", **D. Serrano**, A. Braud, J-L Doualan, P. Camy et R. Moncorgé, Journal of the Optical Society of America B 29 (8), 1854 (2012).

24. "Highly efficient energy transfer in Pr^{3+},Yb^{3+} codoped CaF_2 for luminescent solar converters", **D. Serrano**, A. Braud, J-L Doualan, P. Camy et R. Moncorgé, Journal of the Optical Society of America B 28 (7), 1760 (2011).

25. "Ytterbium sensitization in KY_3F_{10}: Pr^{3+},Yb^{3+} for silicon solar cells efficiency enhancement", **D. Serrano**, A. Braud, J-L Doualan, P. Camy, A. Benayad, V. Ménard et R. Moncorgé, Optical Materials 33, 1028 (2011).

Pre-prints, under review and conference proceedings

26. "Harnessing Atomic Layer Deposition and Diffusion to Spatially Localize Rare-Earth Ion Emitters", A. Ferrier, N. Harada, M. Scarafagio, E. Briand, J-J. Ganem, I. Vickridge, A. Seyeux, P. Marcus, **D. Serrano**, P. Goldner, A. Tallaire, The Journal of Physical Chemistry C, under revision (2020).

27. "Chemically Vapour Deposited Eu^{3+} :Y_2O_3 thin films as a material platform for quantum technologies", N. Harada, A. Ferrier, **D. Serrano**, M. Persechino, E. Briand, R. Bachelet, I. Vickridge, J-J. Ganem, P. Goldner, and A. tallaire, Journal of applied physics, under revision (2020).

28. "Defect Engineering for Quantum Grade Rare-Earth Nanocrystals", S. Liu, A. Fossati, **D. Serrano**, A. Tallaire, A. Ferrier, P. Goldner, doi.org/10.26434/chemrxiv.12273035.v1 (2020).

29. "Dynamic control of Purcell enhanced emission of erbium ions in nanoparticles", B. Casabone, C. Deshmukh, S. Liu, **D Serrano**, A. Ferrier, Thomas H́ummer, P. Goldner, D. Hunger, H. de Riedmatten, arXiv: 2001.08532 (2020).

30. "All-Optical Control of Long-lived Spin Coherences in Rare Earth Doped Nanoparticules", **D. Serrano**. J. Karlsson, A. Fossati, A. Ferrier, P. Goldner, ? CLEO: QELS_Fundamental Science, FTu4H. 7 (2018).

31. "Supercritical angle fluorescence as a tool to study the interaction between lipid bilayer and peptides", V. Dubois, **D. Serrano**, S. Seeger, SPIE Optics+Photonics (2017).

32. "Quantum State Engineering for High Efficiency Quantum Memories and Cavity Line Narrowing", S. Kröll, M. Sabooni, Q. Li, **D. Serrano**, AL. Rippe, CLEO: QELS_Fundamental Science, FF2A. 1 (2014).

33. "Visible to infrared downconversion in rare-earth doped fluorides for luminescent solar converters", **D. Serrano**, A. Braud, J-L Doualan, P. Camy et R. Moncorgé, Proceedings of SPIE 8111-4 (2011).

Participation to conferences and other events

Participation in more than 50 national and international conferences, workshops, summer schools and seminars, in which, more than 30 talks.