



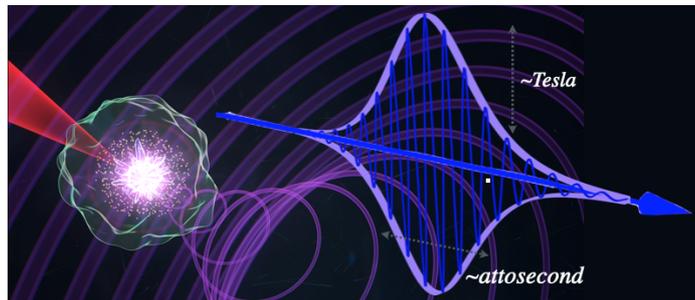
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Post-Doc Position on Theory of Structured Attosecond Pulses Applied to Ultrafast Magnetism

The University of Salamanca (Spain) invites applications for a **3-years postdoc position** starting in October/November 2021. The position is part of the project ATTOSTRUCTURA, “Structured attosecond pulses for ultrafast nanoscience”, funded by the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation program (grant agreement No. 851201), supervised by Dr. Carlos Hernández-García, and with a duration of 5 years.

Application deadline: **August 30th 2021**.

Complete information at: <https://euraxess.ec.europa.eu/jobs/657854>.



The postdoctoral researcher will enrol the project “Structured attosecond pulses for ultrafast nanoscience” at the Laser Applications and Photonics Research group (ALF-USAL) at University of Salamanca (<https://laser.usal.es/alf/en/home/>). ALF-USAL is an interdisciplinary Optics research group with expertise in both theory (strong-field physics, nonlinear optics, ultrafast phenomena, attosecond science) and experiments (ultrashort pulse characterization, pulse shaping, photonic crystals, ultrashort micro-machining). Some of the recent results have been published in high impact factor scientific journals:

- [“Generation of extreme-ultraviolet beams with time-varying orbital angular momentum”](#), L Rego, K M Dorney, N J Brooks, Q Nguyen, C-T Liao, J San Román, D E Couch, Allison Liu, E Pisanty, M Lewenstein, L Plaja, H C Kapteyn, M M Murnane, C Hernández-García, **Science** **364**, eaaw9486 (2019). *Highlighted in the media:*
[Physicists discover croissant-shaped twists of light](#). National Geographic (USA)
[Twisted light gains angular momentum through ‘self-torque’](#). PhysicsWorld (UK)
[Descubierta una nueva propiedad de la luz](#). El País (Spain)
[Físicos españoles descubren una nueva propiedad de la luz](#). El Mundo (Spain)
- [“Controlling the polarization and vortex charge of attosecond high-harmonic beams via simultaneous spin-orbit momentum conservation”](#), K M Dorney, L Rego, N Brooks, J San Román, C-T Liao, J L Ellis, D Zusin, C Gentry, Q Nguyen, J M Shaw, A Picón, L Plaja, H C Kapteyn, M M Murnane, C Hernández-García, **Nature Photonics** **13**, 123–130 (2019).
- [“Ultraindense femtosecond magnetic nanoprobles induced by azimuthally polarized laser beams”](#), M Blanco, F Cambroner, M T Flores-Arias, E Conejero Jarque, L Plaja, C Hernández-García, **ACS Photonics** **6**, 38–42 (2019)

Job Profile

The candidate will explore the application of ultrashort structured pulses in ultrafast magnetism, an emerging field that is opening exciting scenarios in laser-matter interaction at the most fundamental level, merging the fields of Optics and Magnetism. The candidate will count not only with the collaboration of the research team at ALF-USAL, but also with the collaboration of the research group on simulation of magnetic nanostructures SINAMAG at USAL, in particular with Prof. Luis López-Díaz and Dr. Rocío Yanes.



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Successful candidates will have the possibility to consolidate their own independent research lines and to promote collaborative research among the following research lines:

- Development of theoretical simulations of laser-matter interactions in solids, including particle-in-cell (PIC).
- Development of theoretical codes (DFT, atomistic models, etc.) to describe the interaction of structured laser pulses with magnetic materials.
- Implementation of high-performance computing simulations of laser-matter interaction with magnetic materials, with special focus on antiferromagnetic materials.
- Theoretical study of the generation of skyrmionic structures using structured laser pulses.
- Theoretical study of the manipulation of magnetic properties of antiferromagnetic materials driven by femtosecond and attosecond timescales.

Responsibilities

- To develop and implement theoretical models of laser-matter interaction along the described research lines.
- To conduct independent research as well as in collaboration with other members of the group.
- Co-advise undergraduate and Master students at University of Salamanca.

Candidate Requirements

- Ph.D. in Physics, Chemistry or related Engineering degree, at the date of recruitment, with experience in theoretical Atomic, Molecular and Optical Physics, Photonics, Magnetism and/or Condensed matter physics.
- Advanced skills in developing and implementing theoretical simulations of strong field laser-matter interaction, ultrafast magnetism and/or condensed matter physics.
- Demonstrable team working skills.
- Advanced level of English.
- Candidates should be able to demonstrate a promising track record of achievements appropriate to their research field and career stage. CVs will be evaluated taking into account the overall track record of the researcher in relation to their level of experience.

Benefits

- Dynamic and international working environment.
- Training and access to a wide range of scientific facilities.
- Soft skills training.
- Employment conditions:
 - o Full-time employment contract initially limited to three years.
 - o Gross salary of 2.750 €/month.
 - o Estimated starting date: October-November 2021.

Application deadline: August 30th, 2021

Interested candidates should send a CV (maximum 5 pages), a personal statement with scientific interests and reasons for applying, two contacts for recommendation letters to Dr. Carlos Hernández-García (carloshergar@usal.es)

For further information and inquiries please contact Dr. Carlos Hernández-García (carloshergar@usal.es)

More information: <https://euraxess.ec.europa.eu/jobs/657854>