



Marie Skłodowska-Curie POSTDOCTORAL Fellowships 2022

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

FCT NOVA | NOVA School of Science and Technology

RESEARCH GROUP AND URL

LIBPhys-UNL

SUPERVISOR (NAME AND E-MAIL)

Pedro Amaro pdamaro@fct.unl.pt

SHORT CV OF THE SUPERVISOR

Pedro Amaro is Assistant Professor at the Physics Department of NOVA School of Science and Technology, as well as also visiting researcher at Max-Planck Institute for Nuclear Physics. His research interests include topics of atomic physics and x-ray spectroscopy, including both experimental and theoretical aspects: laboratory measurement of cross sections atomic processes relevant for astrophysics; laser spectroscopy in muonic atoms; two-photon and second-order processes; atomic structure and resonant processes; plasma modelling; x-ray fundamental parameters; x-ray fluorescence spectroscopy and applications. Published 50 manuscripts.

5 SELECTED PUBLICATIONS

- [1] P. Amaro, et al, Phys. Rev. A, 103, 012811 (2021).
- [2] J. J. Krauth, CREMA collaboration, Nature, 589, 527-531 (2021).
- [3] F. Grilo, et al, Astrophys. J., 932, 140, (2021).
- [4] C. Shah, et al, Astrophys. J., 881 100 (2019).
- [5] P. Amaro, et al, Phys. Rev. A, 93, 032502 (2016).

This theoretical project focus on a systematic evaluation of two-photon rates of astrophysical interest. The forbidden transition of $2s-1s$ is a prime example of the substantial experimental and theoretical work dedicated to the first excited state of the simplest atom of hydrogen and this effort was originally triggered from astrophysics, since it is the prime source of continuum. Besides H-like and He-like ions, there are no calculations of TP for other isoelectronic sequences available nowadays [5]. Such cases include the isoelectronic sequences of alkaline-earth metals, such as Be-like or Mg-like ions. The role of these new calculations will be attested in astrophysical collision-radiative models (e.g. [3,4]) to answer recent discrepancies in observations. It's expected the candidate to have strong programming and modeling skills. Theoretical work and integration on other collaborations of the group, such as CREMA, is also on the project plan.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST*

PHY

***Scientific Area where the project fits best** – Please select/indicate the scientific area according to the panel evaluation areas: Chemistry (CHE) • Social Sciences and Humanities (SOC) • Economic Sciences (ECO) • Information Science and Engineering (ENG) • Environment and Geosciences (ENV) • Life Sciences (LIF) • Mathematics (MAT) • Physics (PHY)