



**MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIPS 2018**  
**EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS**

### HOST INSTITUTION

NOVA School of Science and Technology | CEFITEC - Centre of Physics and Technological Research

### RESEARCH GROUP AND URL

LCAM - Atomic and Collisions Laboratory  
<http://lcam.cefitec.fct.unl.pt/>

### SUPERVISOR (NAME AND E-MAIL)

Filipe Ferreira da Silva  
[f.ferreiradasilva@fct.unl.pt](mailto:f.ferreiradasilva@fct.unl.pt)

### SHORT CV OF THE SUPERVISOR

F Ferreira da Silva was awarded a PhD degree in Physics from the University of Innsbruck, Austria in 2009. In 2009 during his PhD studies he was awarded the Young Scientist Award by the European Radiation Research Society as well as publishing more than 15 publications in international peer-review journals with high impact factors. Due to the relevance of his research work one of these publications have been chosen as a PCCP hot topic and also highlighted in one of the journal's volume covers. After completing his PhD he was invited for a post doc at the University of Paris in a project led by Professor Léon Sanche. In 2010 he was ranked 1st in the physics panel for a post-doc position, which he carried out until 2015. In 2014 he was awarded by FCT-MCTES with individual fellow position IF-FCT which remains his current position. Recently he was granted with Honorary Visiting Scholar by the Flinders University. F Ferreira da Silva has 83 publications listed in the web of science with a total of more than 600 citations and an h-index of 17. He is a co-author of two book chapters and he has presented 25 invited oral communications and seminars in national and international conferences. His international collaborations with several world leading groups have produced more than 120 poster presentations at international conferences.

<http://docentes.fct.unl.pt/fr-silva/>

### 5 SELECTED PUBLICATIONS

- G. Meneses, C. Widmann, T. Cunha, F. Ferreira da Silva\*, A. Gil, M. Calhorda, P. Limao-Vieira; "Unravelling Dissociation Pathways of Acetic Acid upon Electron Transfer in Potassium Collisions: Experimental and Theoretical Studies"; *Phys. Chem. Chem. Phys.* 19, (2017), 1083-1088.
- D. Pastega, E. Lange, J. Ameixa, A. S. Barbosa, F. Blanco, G. García, M. H. F. Bettge, P. Limão-Vieira and F. Ferreira da Silva; "Combined experimental and theoretical study on the differential elastic scattering cross sections for acetone by electron impact energy of 7.0 – 50 eV"; *Physical Review A*, 93, (2016), 032708.



UNIVERSIDADE  
**NOVA**  
DE LISBOA

- M. Neustetter, J. Aysina, F. Ferreira da Silva\* and S. Denifl; "The effect of solvation in electron attachment to pure and hydrated pyrimidine clusters"; *Angewandte Chem. Int. Ed*, 54, (2015), 9124-9126.
- F. Ferreira da Silva, C Matias, D. Almeida, G. Garcia, O. Ingolfsson, H. D. Flosadottir, B. Omarsson, S. Ptasinska, B. Puschnigg, P. Scheier, P. Limaó-Vieira and S. Denifl; "NCO, a key fragment upon dissociative electron attachment and electron transfer to pyrimidine bases: site selectivity for a slow decay process"; *J Am Soc Mass Spectr*, 24, (2013), 1787-1797.
- D. Almeida, F. Ferreira da Silva, G. Garcia and P. Limaó-Vieira; "Selective bond cleavage in potassium collisions with pyrimidine bases of DNA"; *Phys. Rev. Lett.*, 110, (2013), 023201.

## PROJECT TITLE AND DESCRIPTION

### *Low energy electron driven reactions in boron containing molecules*

This PhD proposal aims to study fragmentation pathways of boron-containing compounds, such as aryl boronic acids, triggered by low energy electron interactions. These studies will be performed in a crossed beam apparatus equipped with trochoidal electron monochromator together with a time of flight mass spectrometer.

Different aryl boronic acids will be studied in order to understand the fragmentation pathways as well as the influence of nitro or halogen substitute. Boron-containing molecules are well established in drug design and were found to be excellent candidates for pharmaceutical applications. After Velcade, boronic acid, being recognised by US FDA, the increasing of interest in medicinal boron-containing drugs has been verified. Understanding underlying fundamental molecular mechanisms is crucial in getting better knowledge about molecular targets under study. Low energy electrons play an important role in molecular chemistry, and reactions triggered by electrons can determine fragmentation routes and be a tool in drug design.

The candidate will be involved in a crossed molecular beam apparatus, expecting to lead the experimental routines as well as co-supervise MSc and PhD students.

#### SCIENTIFIC REQUIREMENTS

PhD in Physics, Physical Chemistry, Engineering Physics, Biochemistry or related field, with at least 4 years proven experience; Knowledge in mass spectrometry; Additional: theoretical quantum chemistry.

## SCIENTIFIC AREA WHERE THE PROJECT FITS BEST

Physics (PHY)