

Department of Physics

Atomic, Molecular and Bio Systems

CFA FCT/UNL and LIBPhys FCT/UNL



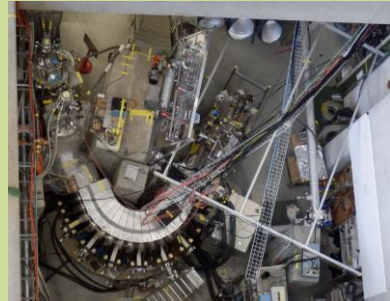
José Paulo Santos

Associate Professor w/ Habilitation

- Physics Engineer (1988, UNL)
- MSc in Physics (1992, UL)
- PhD in Physics (1998, UNL)
- Habilitation (Agregação) in Physics (2005, UNL)

Objectives

- Theoretical and experimental study of regular atomic systems and exotic atomic systems
- Ab initio and density functional calculations of several molecular properties
- Measurement of trace elements in biological tissues
- Study of the light propagation in tissues and organs



Methodology

- Resolution of the Dirac equation and considering QED effects
- PIXE and EDXRS techniques
- Photoelectron Spectrometry technique
- Electron-Cyclotron Resonance Ion Sources (ECRIS)
- Synchrotron Radiation
- Geant4 (for GEometry ANd Tracking) platform
- ROOT object-oriented program



Expected Results

- Calculation of atomic energy levels, transition energies, radiative and radiationless transition probabilities
- Electron impact ionization cross sections for several atomic systems
- High precision measurements (<2 ppm) of the transition energies in highly-charged ions
- Tenfold improvement of the 4He charge radius and absolute determination of charge radii of several He isotopes measured relative to 4He
- Electronic configuration of instable molecules, such as azides
- Influence of Trace Elements in cancerigenous tissue

