



**POSITION: *PhD in ATOMIC COLLISIONS and ELECTRON SPECTROSCOPY***

**JOB TITLE:** PhD student position, Dept. of Physics, University of Crete for work within research project **APAPES**

**PLACE OF EMPLOYMENT:** 5MV Tandem accelerator Laboratory, Institute of Nuclear Physics (INP), National Centre for Scientific Research DEMOKRITOS, Agia Paraskevi, Prefecture of Attica, Athens, GREECE

**CONDITIONS:** Employment can be expected to commence not earlier than 15/11/2012 and only after all hiring procedures have been completed. Candidate is expected to reside in Attica during employment.

**SALARY:** 51.408€ (before withholdings) for 36 months employment

**SOURCE OF FINANCIAL SUPPORT:** Co-financed by the European Union (European Social Fund - ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) - Research Funding Program: THALES, grant contract MIS 377289

**REQUIRED QUALIFICATIONS:** Recent MS (last 3 years) in Physics or equivalent from a recognized institution of higher learning. Excellent knowledge of English (at least B2 level in both the spoken and written language).

**ADDITIONAL QUALIFICATIONS:** Experience/knowledge in any of the following will be especially desirable:

- Advanced courses in atomic physics
- Measurements, detection and energy analysis of ions/electrons at accelerator facilities
- Programming (languages FORTRAN, C, C++, MATLAB, Mathematica etc.), familiarity with Windows and Linux operating systems. Web administration and composition of webpages in html, php etc.
- NIM electronics and data acquisition systems
- Charged particle optics simulation software (e.g. SIMION, CPO etc.).
- Mechanical drawing and design using CAD software.

**DUTIES AND RESPONSIBILITIES:** Involvement in research and educational activities within the context of the research program APAPES including:

- Design and installation of a new experimental atomic physics setup including dedicated beam line, vacuum systems, collision chamber, gas target, and electron spectrometers
- High resolution electron spectroscopy for the determination of ion-atom collision cross sections in collaboration with other members of the research team
- Data acquisition and analysis
- Writing scientific publications and technical reports
- Presentation of results at international meetings
- Participation in other related research and educational activities of the *Tandem Lab* at the INP and the *Atomic collisions and Electron spectroscopy* lab of the principal investigator

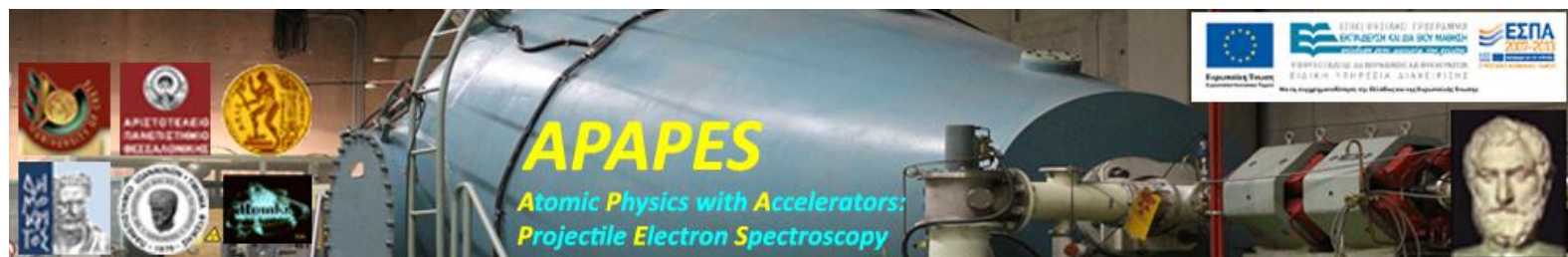
**REQUIRED DOCUMENTS:** Interested applicants should submit (in Greek or English) the following material:

1. CV of previous experience with special reference to the required qualifications (*use model CV form*)
2. Copies of university degrees (BS and MS or equivalent) with grade transcripts and grade point average.
3. Arrange for the timely submission of two (2) confidential letters of support from university professors (by direct e-mail to the Principal Investigator (PI) Prof. *Theo J.M. Zouros* at [tzouros@physics.uoc.gr](mailto:tzouros@physics.uoc.gr))

*All material must refer to proposal for call 6723 and be submitted electronically to [vlachaki@elke.uoc.gr](mailto:vlachaki@elke.uoc.gr) (Ms. Rena Vlachaki, Secretariat of the Special Research Account of the Univ. of Crete tel. +30-2810-393171) with a cc to the PI by 31/10/2012, 14:30.*

*Applications that are NOT complete will not be considered further. Any required personal interview will be conducted in English within 10 days of the closing deadline.*

**ADDITIONAL INFORMATION:** directly from the APAPES project website <http://apapes.physics.uoc.gr/>



<http://apapes.physics.uoc.gr>

## BRIEF DESCRIPTION OF THE PROJECT

Title: **Atomic Physics with Accelerators: Projectile Electron Spectroscopy at the TANDEM accelerator of the NSCR "Demokritos" – APAPES**

Website: <http://apapes.physics.uoc.gr>

Principal Investigator: **Assoc. Prof. Theo J.M. Zouros, Atomic & Molecular Physics, Dept. of Physics, University of Crete**

Project duration: **48 months**

Budget: **600 k€**

*Abstract: Accelerator based atomic physics will be introduced and promoted by combining the existing interdisciplinary atomic collisions expertise from three Greek universities, the strong support of distinguished foreign researchers and the high technical ion-beam know-how of the tandem accelerator nuclear physics group into a cohesive initiative. Collaborative experiments will be conducted using state-of-the-art technology, while young researchers will be trained gaining valuable hands-on expertise. More specifically, the project includes:*

- The use of the 5.5 MV TANDEM accelerator of the Institute of Nuclear Physics (INP) at the National Research facility Demokritos in Athens as a user facility for the production and acceleration of highly charged ions*
- The construction of a new dedicated high vacuum beam line using state of the art research equipment for the study of ion-atom collisions*
- The installation and operation of electron spectrometers for use with the technique of Zero-degree Auger Projectile Spectroscopy (ZAPS)*
- The collaboration of researchers from the universities of Crete, Ioannina, Thessaloniki and the INP*
- The participation and training of young scientists including post doctorate fellows, PhD, graduate and undergraduate students with the support of technical staff*
- The collaboration of distinguished foreign scientists specialist in the electron spectroscopy of ion-atom collisions*

*The scientific goals of the APAPES initiative include:*

- The promotion of basic research on current problems in the field of atomic collision physics*
- The systematic training of young researchers in the techniques of atomic physics and especially those related to electron spectroscopy and atomic collisions*
- The advancement of the ZAPS technique through the development of new improved electron spectrometers*
- The development of new methods for the production of ground state and metastable He-like ion beams and their use in high energy resolution spectroscopy experiments*

*With the newly installed ZAPS setup we shall complete a systematic isoelectronic investigation of K-Auger spectra emitted from collisions of pre-excited ions utilising novel techniques. The new results are expected to lead to a deeper understanding of the neglected importance of cascade feeding of metastable states of ions in collisions with gas targets and further elucidate its role in the non-statistical production of excited three-electron states by electron capture, recently a subject of renewed interest and conflicting interpretations awaiting further resolution.*