JOB OFFER

Position in the project:	Post-doc
Scientific discipline:	physics, biophysic, medical physics, computer science, electronics
Job type (employment contract/stipend):	Employment contract
Number of job offers:	3
Remuneration/stipend amount/month:	11500 PLN - full remuneration costs including social and health insurances 6239 PLN /month net salary plus thirteenth salary
Position starts on:	01.06.2018
Maximum period of contract/stipend agreement:	34 months
Institution:	Jagiellonian University, Faculty of Physics, Astronomy and Applied Computer Science
Project leader:	Prof. dr hab. Paweł Moskal
Project title:	Jagiellonian Positron Emission Tomography: a novel in vivo morphometric imaging with positronium Project is carried out within the TEAM programme of the Foundation for Polish Science
Project description:	The project aims at the elaboration of novel cancer staging indicators based on the properties of positronium atoms formed in the human body during the PET diagnosis and the elaboration of the method for in vivo imaging of these indicators. The basis of the research constitutes the Jagiellonian Positron Emission Tomograph (J-PET) whose novelty lies in employing long strips of plastic scintillators instead of small size crystals as detectors of annihilation photons. We will explore new possibilities opened by the J-PET tomograph enabling measurement of the lifetime and production probability of positronium atoms formed copiously inside human body during the routine PET imaging. This fact was never used so far in the medical diagnosis. The probability of creation and lifetime of an ortho-positronium atom depend strongly on the size of the free volumes between molecules. By the realization of this project we aim at (i) establishing correlations between values of novel indicators based on properties of positronium atoms trapped in the inter-molecular voids inside the cells and the routinely available histopathological characteristics of tumors as well as (ii) evaluation and validation of the method for the reconstruction of novel morphometric images showing the spatial distribution in the diagnosed organism of positronium properties such as: mean lifetime, production probability and ratio of annihilation rates into two and three photons.
Key responsibilities include:	Postdoc-1: Elaboration of the hit-time and hit-position reconstruction methods, as well as time and energy calibration methods for the new modular J-PET tomograph, Commissioning of the modular tomograph. Elaboration of the event selection methods. Studies of correlations between the positronium- and histopathological-diagnostic indicators (in vitro studies with breast and rectal cancers). Postdoc-2: Elaboration of algorithms and reconstruction methods for multi-photon positronium imaging with the J-PET tomograph. Implementation of the positronium imaging procedures in the J-PET analysis computer framework. Conducting experiments with phantoms as well as cancer and healthy tissues. Validation of the image reconstruction procedures.

	Postdoc-3: Elaboration of attenuation corrections methods for imaging of positronium properties. Implementation of the image reconstruction procedures (off-line and on-line) and image correction in the programmable electronics of the J-PET tomograph. Elaboration, tests and commissioning of the data acquisition system and real-time reconstruction of the modular J-PET tomograph.
Profile of candidates/requirements:	PhD degree in the field of Natural Sciences, Engineering, Computer Science, Mathematics or related field of science. A strong motivation to conduct experimental research. Good knowledge of English (spoken and written). Postdoc-1: Experience in data analysis and simulations, advanced statistics, detection of nuclear radiation, computer programming, and preferably in positron emission tomography and image reconstruction methods. Postdoc-2: Experience in data analysis and simulations, advanced statistics, detection of nuclear radiation, computer programming, and preferably in positron emission tomography and image reconstruction methods. Postdoc-3: Experience in data acquisition systems, programmable electronics (FPGA), computer programming, and preferably in positron emission tomography and image reconstruction methods.
Required documents:	The candidates should submit applications containing the following documents 1. Short application including motivation letter (maximum two pages), 2. Scientific CV including list of publications and list of presentations at conferences, 3. At least two letters of recommendation
We offer:	We offer interdisciplinary research in the international group in the unique laboratory with the first in the world multi-photon positron emission tomograph. The project interfaces technologies from a variety of disciplines including biology, biophysics, computer science, electronics, engineering, physics and medicine.
Please submit the following documents to:	pawel.moskal@uj.edu.pl
Application deadline:	13.05.2017
For more details about the position visit:	http://koza.if.uj.edu.pl/pet/
Euraxess job/stipend offer (in case of PhD and postdoc positions)	https://www.euraxess.pl/jobs/298197

Please include in your offer: "I hereby give consent for my personal data included in my application to be processed for the purposes of the recruitment process under the Personal Data Protection Act as of 29 August 1997, consolidated text: Journal of Laws 2016, item 922 as amended."