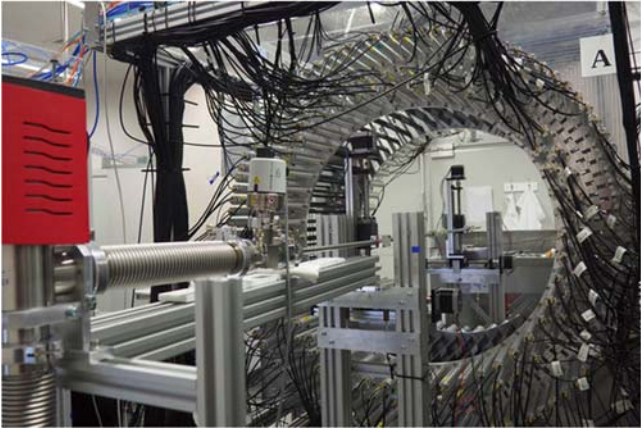


Scientific supervisor	
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Department	Experimental Particle Physics and Applications
Laboratory	J-PET
Group webpage	http://koza.if.uj.edu.pl/
Proposed research topic <i>Positronium decay in porous polymers.</i>	
Short description (< 1000 characters) <p>The aim of the research is to determine the influence of porous polymers on the positronium lifetime, i.e. an atom consisting of an electron and a positron (electron antiparticle, which is formed as a result of β^+ decay in a pharmaceutical). This atom decays after some time, emitting photons as a result of the annihilation of the positron with the bound electron or other electron from the environment. The lifetime of a positronium is therefore influenced by the number of electrons available around it and the pressure of the gas in which it is located.</p> <p>In frame of the internship, the student will have the opportunity to acquire knowledge about the conducted research (theoretical basis, statistics), get acquainted with the J-PET detection system unique in the world (Fig. 1) (learning how to use the device, conduct measurements), and then perform an experiment in which the pharmaceutical is placed in several different porous materials. The collected data will then be analyzed for the positronium lifetime measurement.</p>	
	
<p>Fig. 1 J-PET detector used to perform measurements, with a small annihilation chamber inside.</p>	
<p>The level of research will be adapted to the degree of study. Each step of the experimental work and data analysis will be explained on an ongoing basis and according to individual needs.</p>	
Main research tool J-PET detector, oscilloscope, C++/python, ROOT library	
Additional requirements to the candidate Students of experimental physics or materials engineering. Nice to have: willingness to learn, research enthusiasm, diligence and punctuality.	
Possibility to continue student internship in the form of:	
Diploma thesis (master's or bachelor's degree)	X
PhD study	X