

Scientific supervisor	
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Department	Department of Experimental Computer Physics
Laboratory	Low-level radioactivity laboratory
Group webpage	
Proposed research topic	
<i>Measurements of the thermal neutron flux with He-3 counters.</i>	
Short description (< 1000 characters)	
<p>In the environment around us, in addition to the alpha, beta and gamma radiation, we also have to deal with neutrons. Neutrons can be produced as a result of nuclear reactions or as a result of interactions caused by cosmic radiation. From the point of view of dosimetry, the impact of neutrons on living organisms can be much more significant than, for example, impact of the gamma radiation.</p> <p>The signal generated by neutrons poses an undesirable background in many experiments, which are devoted, for example, to search for a very weak signal from the neutrinoless double beta decay, dark matter interactions or even in the case of ordinary gamma spectrometers based on germanium detectors.</p> <p>In the frame of the internship, students will learn about the construction and principle of operation of neutron detectors, especially those based on He-3. These detectors are characterized by a very high efficiency of detection of thermal neutrons and, when installed in an appropriate moderator, also allow to register the spectrum of fast neutrons.</p> <p>During the intership students will carry out thermal neutron flux measurements for various locations - the available system of 8 large counters with a data acquisition system is mobile and suitable for operation, for example, in mines or underground laboratories. Attempts can also be made to record the spectrum of environmental neutrons by placing the counter in a suitable moderator.</p>	
Main research tool	
High sensitivity He-3 counters.	
Additional requirements to the candidate	
Basic knowledge about natural radioactivity and dosimetry	
Possibility to continue student internship in the form of:	
Diploma thesis (master's or bachelor's degree)	X
PhD study	X