

Theoretical Physics Division Seminar

Fundamental Research Department
NATIONAL CENTRE FOR NUCLEAR RESEARCH

09.06.2021 (Wednesday); Time: 15:00

PLEASE NOTE THE TIME CHANGE!

The seminar is held online:

https://www.gotomeet.me/NCBJmeetings/bp2_seminar

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Hunting for FIMPs at particle colliders and in the sky

ABSTRACT:

Feebly Interacting Massive Particles (FIMPs) are dark matter candidates that are produced in the early universe via a mechanism known as freeze-in. Their couplings to visible particles are very tiny and therefore searching for FIMPs is extremely challenging. In this talk, I will discuss two strategies to unveil the properties of these elusive particles. Displaced events at colliders are a promising way, even though typical decay lengths as obtained from relic density calculations are way too large to observe anything in our detectors. I will show how motivated modifications of the cosmological history naturally lead to displaced events; intriguingly, the observation of a displaced event could reveal something about the thermal history of our universe. Furthermore, if the FIMP particle is light enough then it can suppress cosmological structures at small scales. Working in a model-independent fashion, I will present lower bounds on the FIMP mass for different production mechanisms.