

## **HECA Seminar**

(High Energy, Cosmology and Astro-particle physics)

[HECA web-page](#)

Tuesday 14.01.2020, h 12:00

Pasteura 5, room B2.38 (Faculty of Physics)

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## **New effects in Dark Matter production**

### Abstract

How was dark matter produced in the early Universe? Answering this question is of great importance since it allows us to predict the expected experimental signatures. I will discuss non-perturbative effects in coannihilation driven freeze-out, i.e. Sommerfeld enhancement and bound state formation in a thermal environment, and analyze the connection with phenomenology. In addition, I will comment on the conditions for freeze-out and point out an alternative production mechanism of dark matter which relies on conversion processes instead of annihilations. Interestingly, this mechanism points towards long-lived particles that could be observed at the LHC.

Best regards,

Andrzej Hryczuk  
Kamila Kowalska  
Kazuki Sakurai  
Enrico Maria Sessolo  
Krzysztof Turzyński