## Enlarging the ALP Dark Matter window with axion fragmentation

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Axion-like-particle (ALP) is a well-motivated candidate for dark matter, and it is subject to extensive theoretical and experimental research in recent years. The ALP production mechanisms mostly studied in the literature are misalignment, thermal production in the plasma, and decay of cosmic strings. Recently, a new mechanism, axion fragmentation, has been proposed. It can arise if the axion field has a large initial kinetic energy and rolls through many barriers before it gets trapped in one minimum. Contrary to the misalignment mechanism, the axions produced this way are relativistic, and they cool down later to make cold dark matter. In this talk, after a brief review of axion fragmentation, I will discuss the impact of this new mechanism on the allowed parameter space for ALP dark matter. I will show that axion fragmentation widely opens the parameter space towards higher values fo axion-photon coupling, which can be probed by a whole set of upcoming experiments, including ALPSII, babyIAXO, MADMAX, and many others.

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