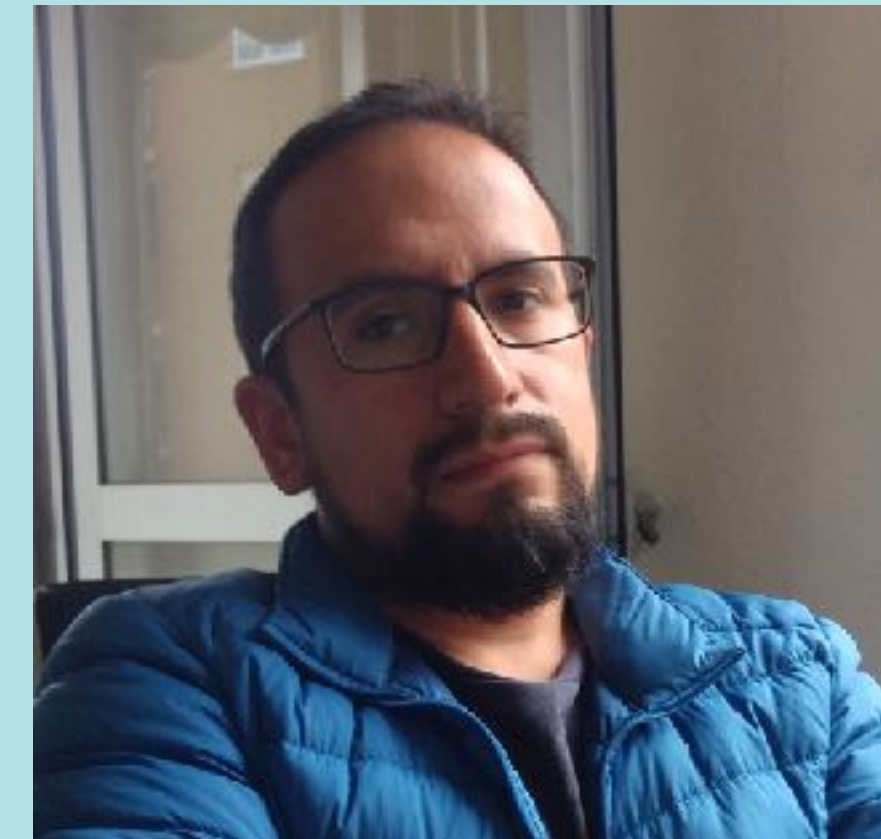


Reheating and Dark Matter Production

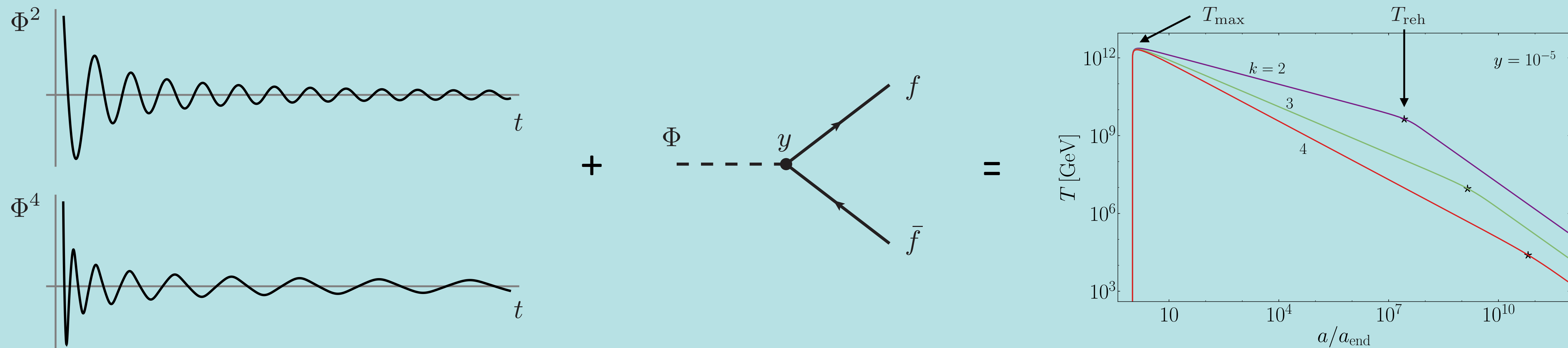
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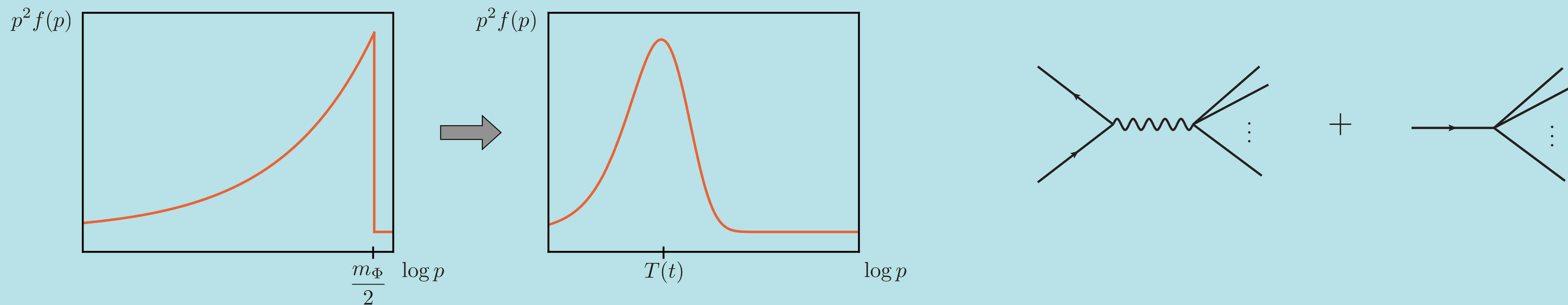
I present a systematic analysis of dark matter production during post-inflationary reheating, showing that dark matter production is sensitive to the inflaton potential, and depends on the thermalization rate when the potential is not quadratic near the minimum. I also discuss how to exploit dark matter as a probe of the dynamics during reheating, through smoking-gun signals such as monochromatic neutrinos or gamma-ray lines, or through Lyman- α data.

Inflationary reheating was the stage of very rich dynamics...

The decay of the inflaton Φ depends on the shape of the potential and the coupling to matter/radiation



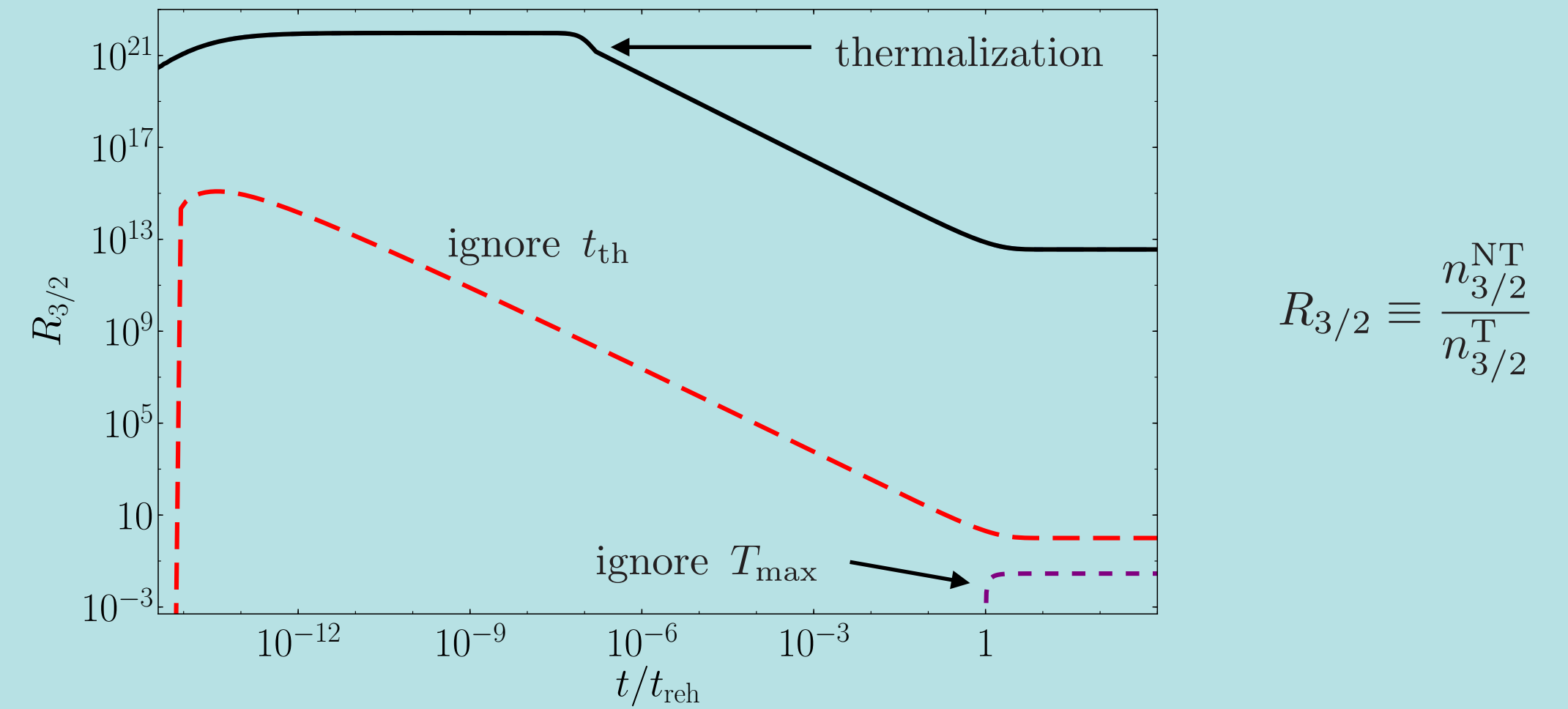
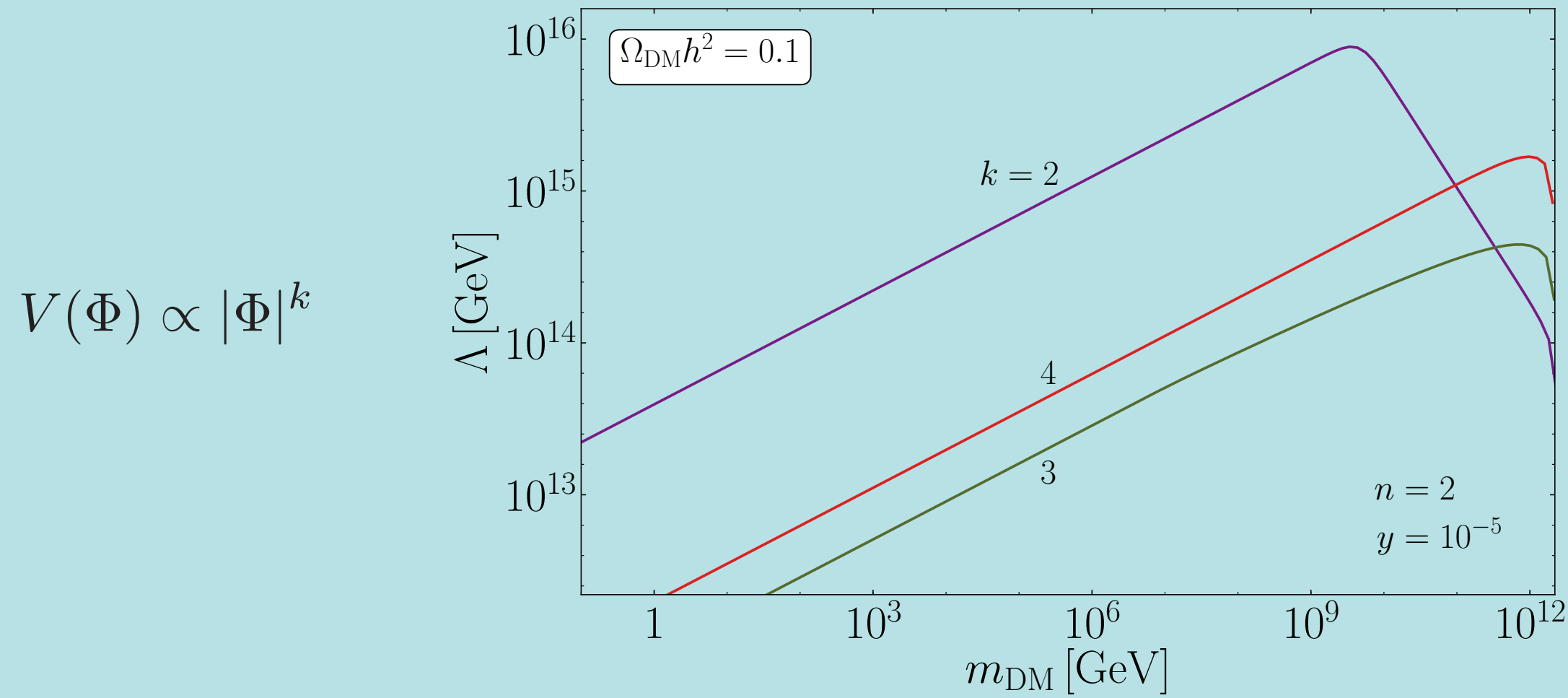
The decay products evolve from a very non-thermal state to a thermal one during reheating



... do these dynamics leave an imprint on Dark Matter?

Yes!

If the Dark Matter production cross section scales as $\sigma(s) = \frac{s^{n/2}}{\Lambda^{n+2}}$ with $n > -1$, then it is produced out of equilibrium during reheating. Abundances are sensitive to the inflaton potential and the time-scale of thermalization



Bounds on these models can be obtained from indirect gamma and neutrino detection, and structure formation

