

# Reading material

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## 1 Pre-lecture reading

I will discuss the evidences for dark matter, thermal and non-thermal production of dark matter, as well as their detections. Therefore, it would be helpful if you familiar yourself with the following concepts. You are not required to know Quantum Field Theory or General Relativity, but please go through the Wikipedia page of the following:

- Lagrangian, equation of motion
- Cross section and mean free path
- Cosmic Microwave Background
- Friedmann–Robertson–Walker metric
- Friedmann equations

There are also some post lecture reading assigned. If a url is not provided, check out the wikipedia page of the following concepts. The last item usually requires some understanding of QFT.

## 2 Lecture 1

- Natural units
- Galaxy rotation curves
- Want a challenge? Wayne Hu's CMB tutorials <http://background.uchicago.edu/>

## 3 Lecture 2

- Hierarchy problem
- Minimal Supersymmetric Standard Model
- Weakly interacting massive particles
- Want a challenge, section 2 and 3 of TASI lecture <https://pos.sissa.it/333/005/pdf>

## 4 Lecture 3

- Strong CP problem
- QCD axion
- Want a challenge? TASI lecture <https://arxiv.org/abs/1812.02669>

## 5 Lecture 4

- CDMS experiment <https://supercdms.slac.stanford.edu/overview>
- ADMX experiment.
- Indirect detection of dark matter