Curriculum


United Kingdom
Belgium
Germany
Luxembourg
Czech Republic
France
Switzer-land
Liecht.
Austria
Slove-nia
Croatia
Monaco
San Marino
Andorra

Curriculum

Born & undergrad Utrecht

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2006 - 2009
Ph.D. Annecy
(w. Lesgourgues)

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2009 - 2011 postdoc RWTH	**Aachen**

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2015 CERN	Geneva

Curriculum

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(w. Lesgourgues) An

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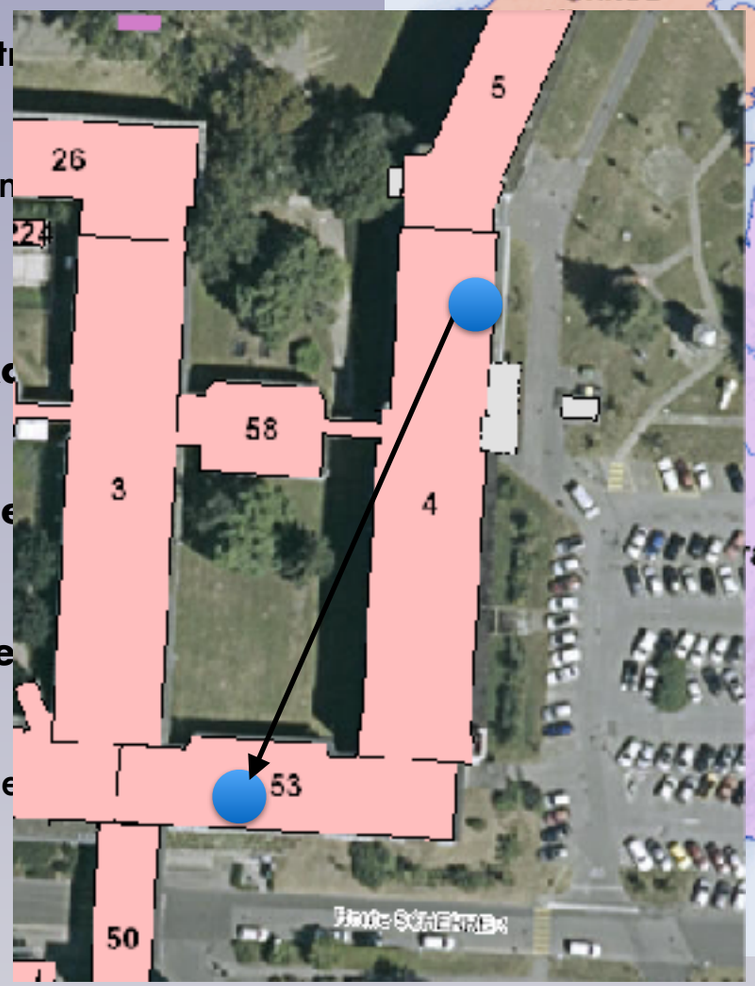
postdoc RWTH **Ac**

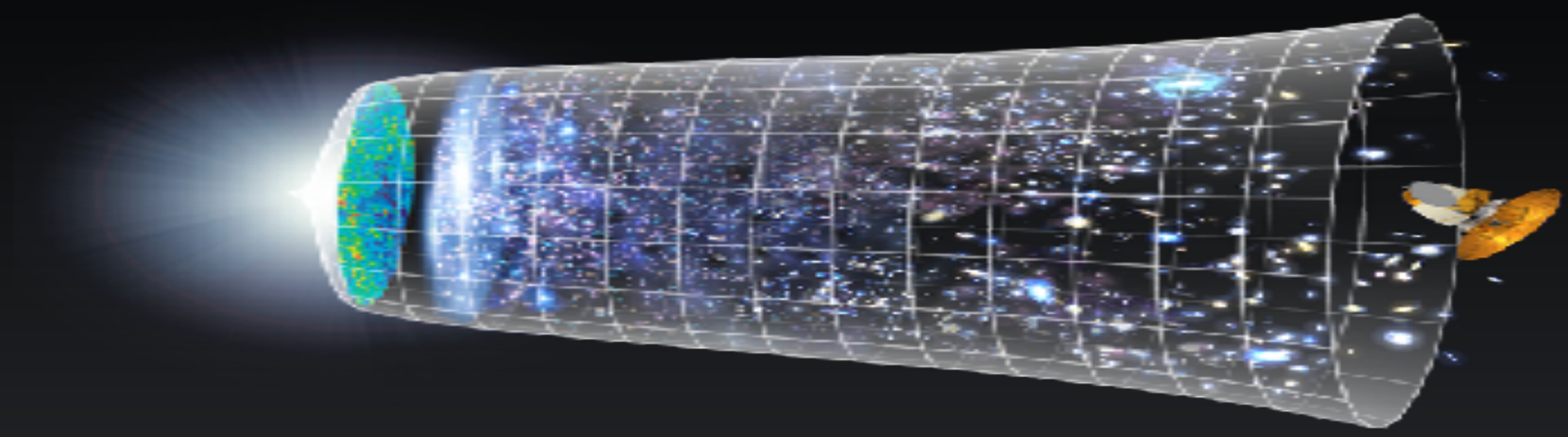
2011 - 2012
postdoc ITP **He**

2012 - 2015
Veni fellowship **Le**

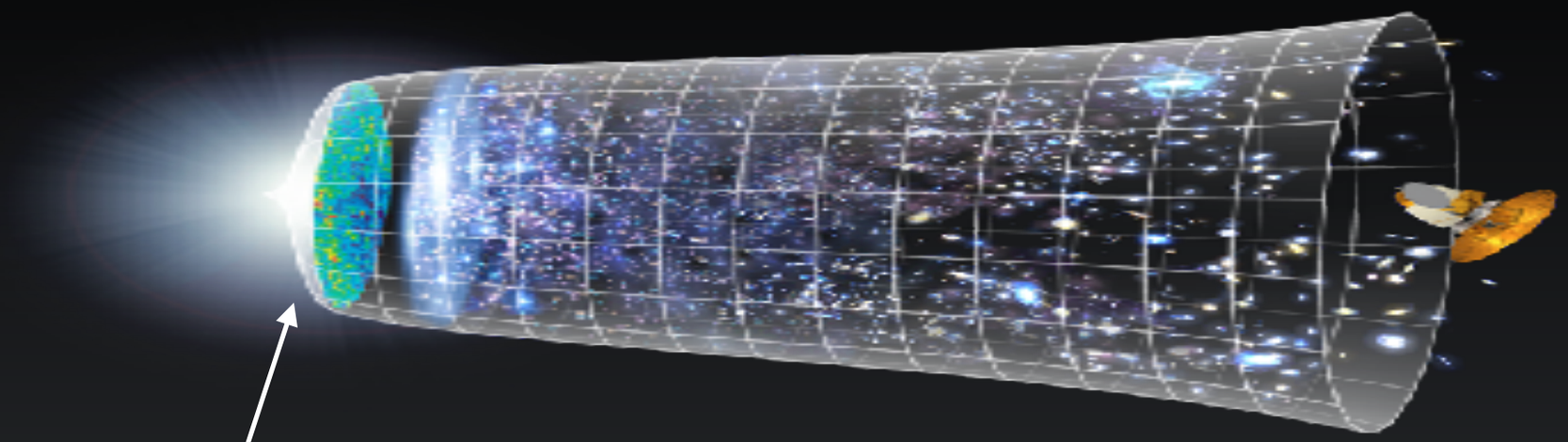
2015
CERN Ge



Curriculum

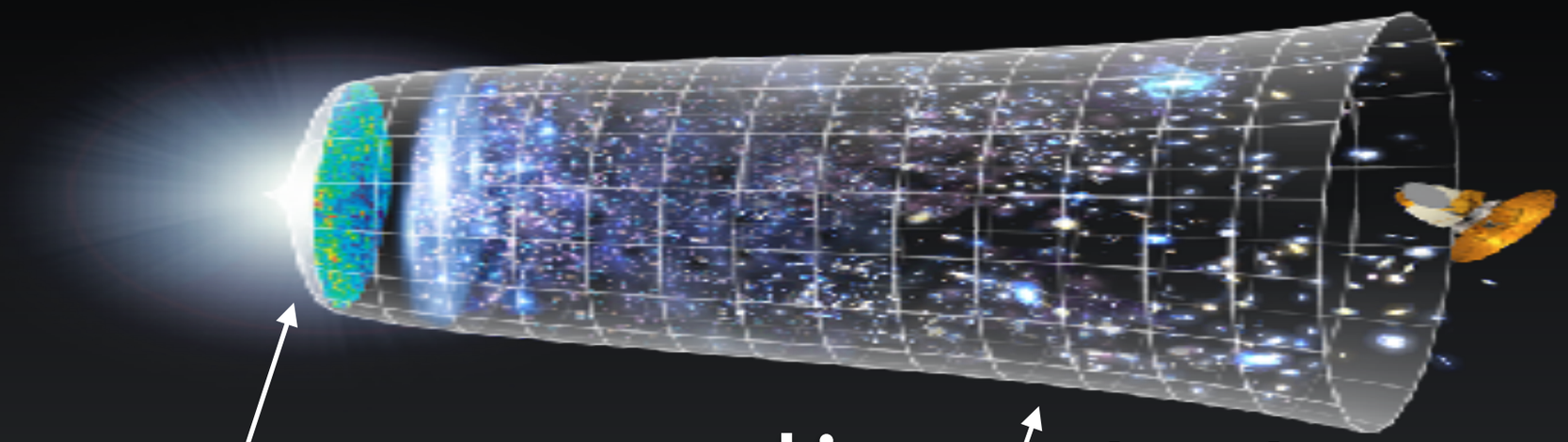


Curriculum



Inflation

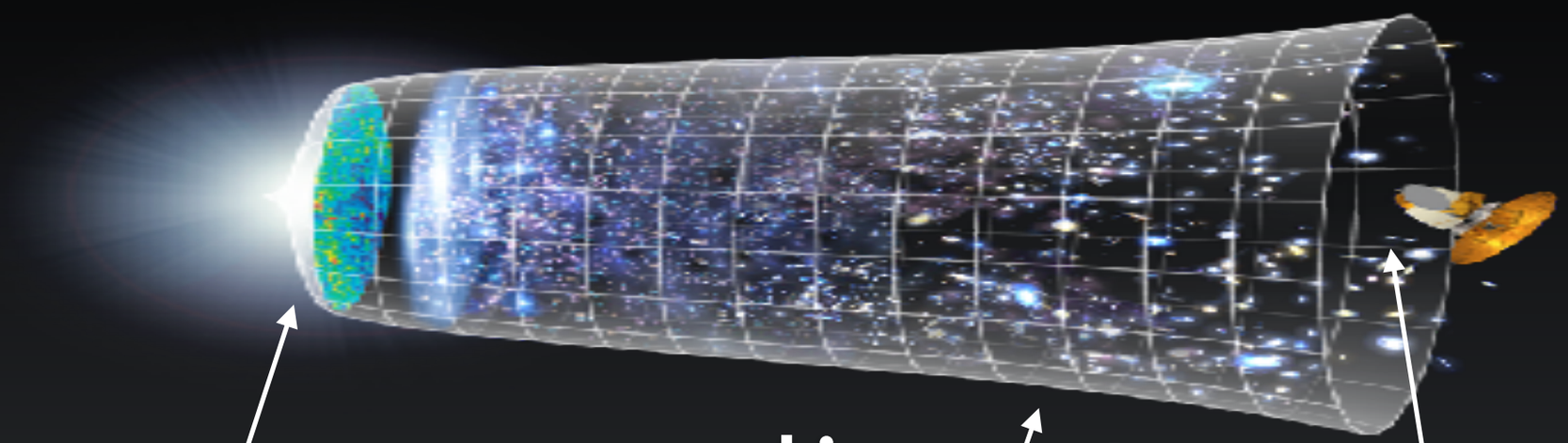
Curriculum



Inflation

Linear structure
and neutrinos

Curriculum

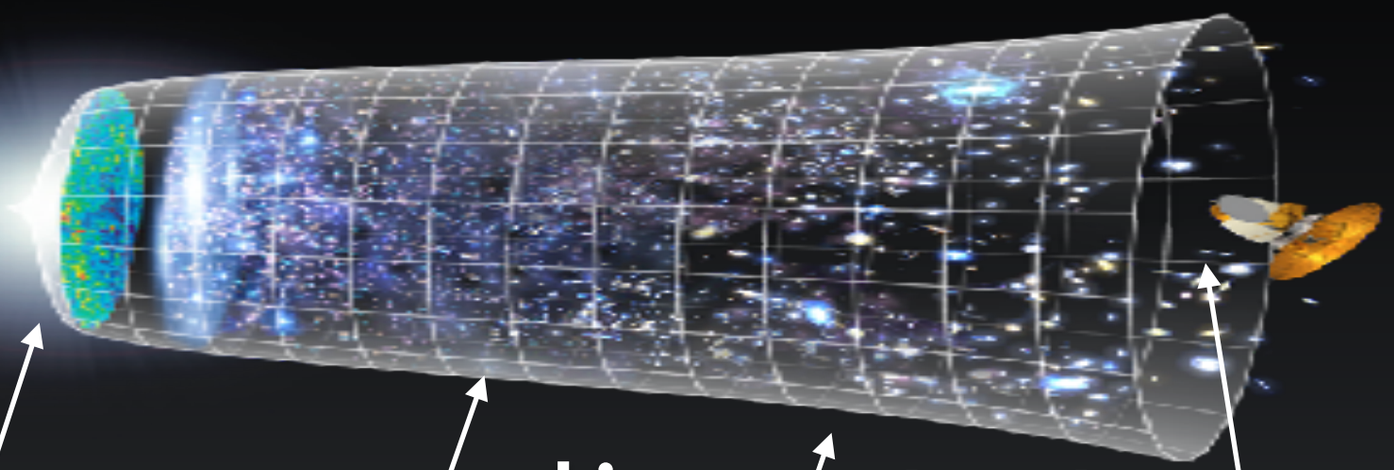


Inflation

Linear structure
and neutrinos

Voids and
other DE-alternatives

Curriculum



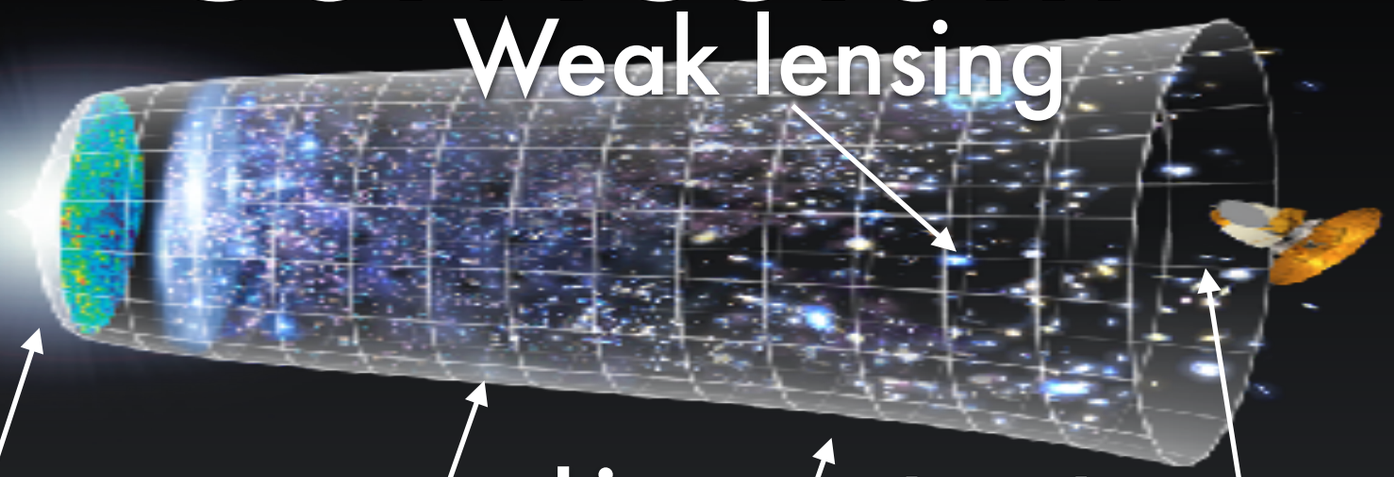
Inflation

Initial conditions for cosmological simulations of large scale structure

Linear structure and neutrinos

Voids and other DE-alternatives

Curriculum



Weak lensing

Inflation

Initial conditions for cosmological simulations of large scale structure

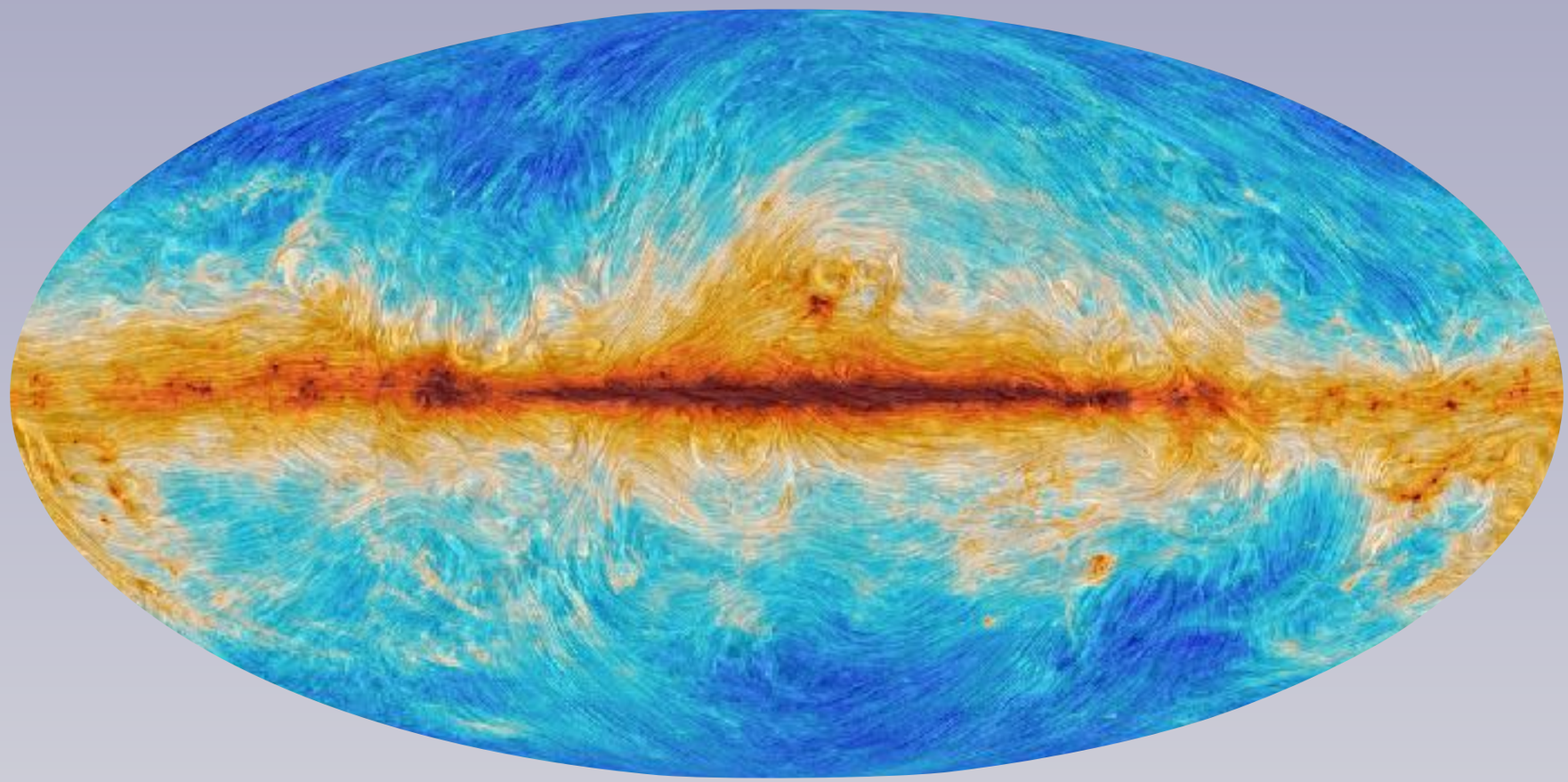
Linear structure and neutrinos

Voids and other DE-alternatives

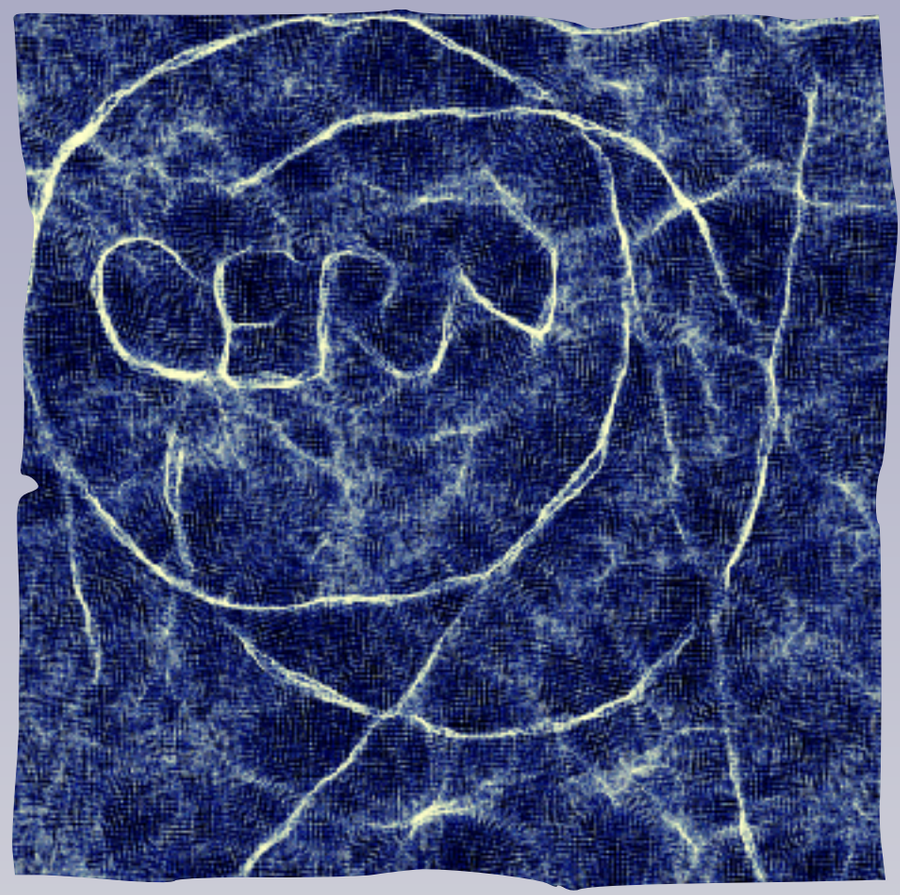
Dark Matter

- Many of you bet their careers on it
- Phenomena that demand DM
- ...

- Phenomena that demand DM
- CMB anisotropy spectrum

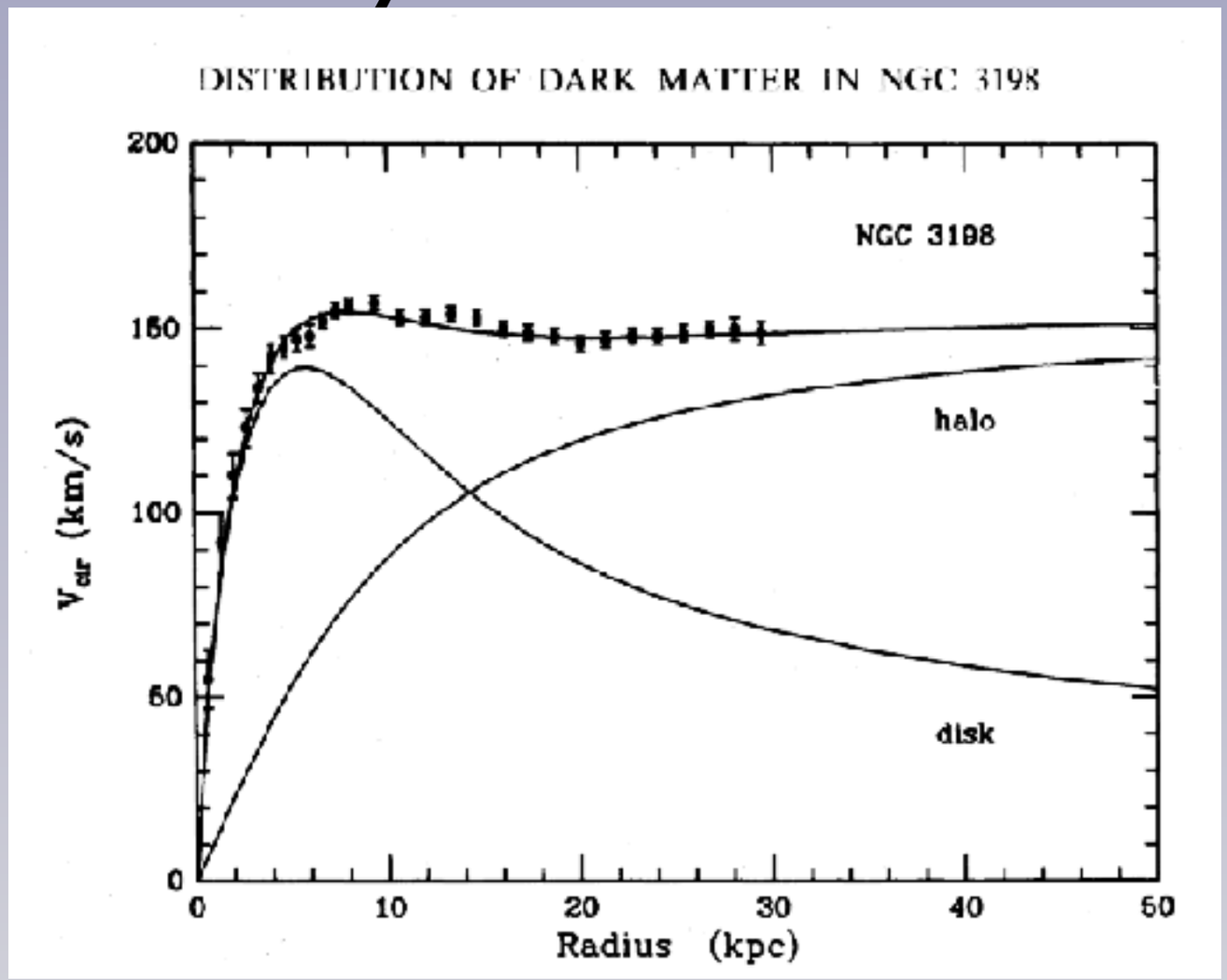


- Phenomena that demand DM
  - Large scale structure formation



- Phenomena that demand DM
- Lensing in galaxy clusters

- Phenomena that demand DM
  - Galaxy rotation curves



- Phenomena that demand DM

- Phenomena that demand DM
  - And of course

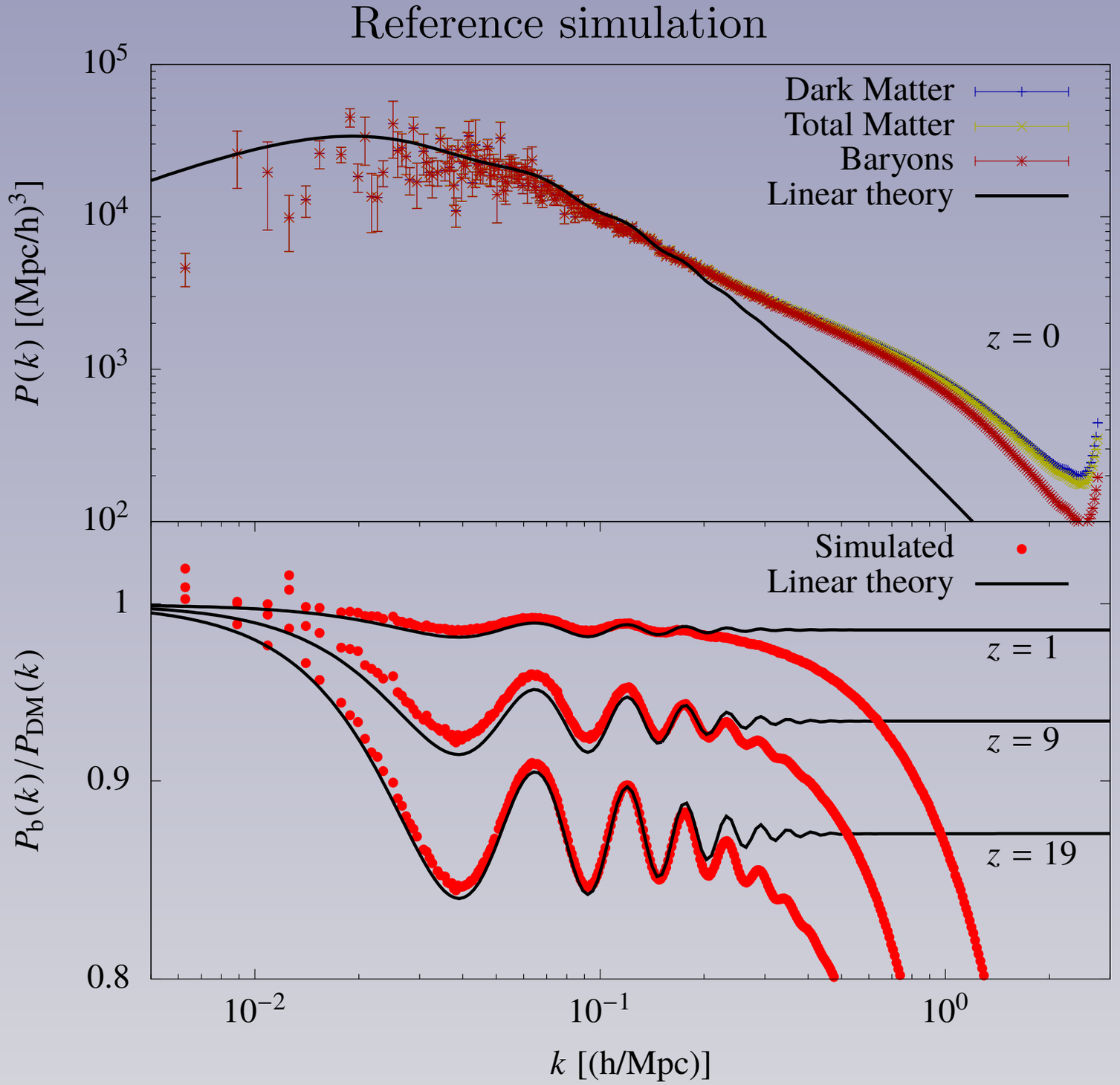
- Phenomena that demand DM
  - And of course
  - all recent LHC discoveries…

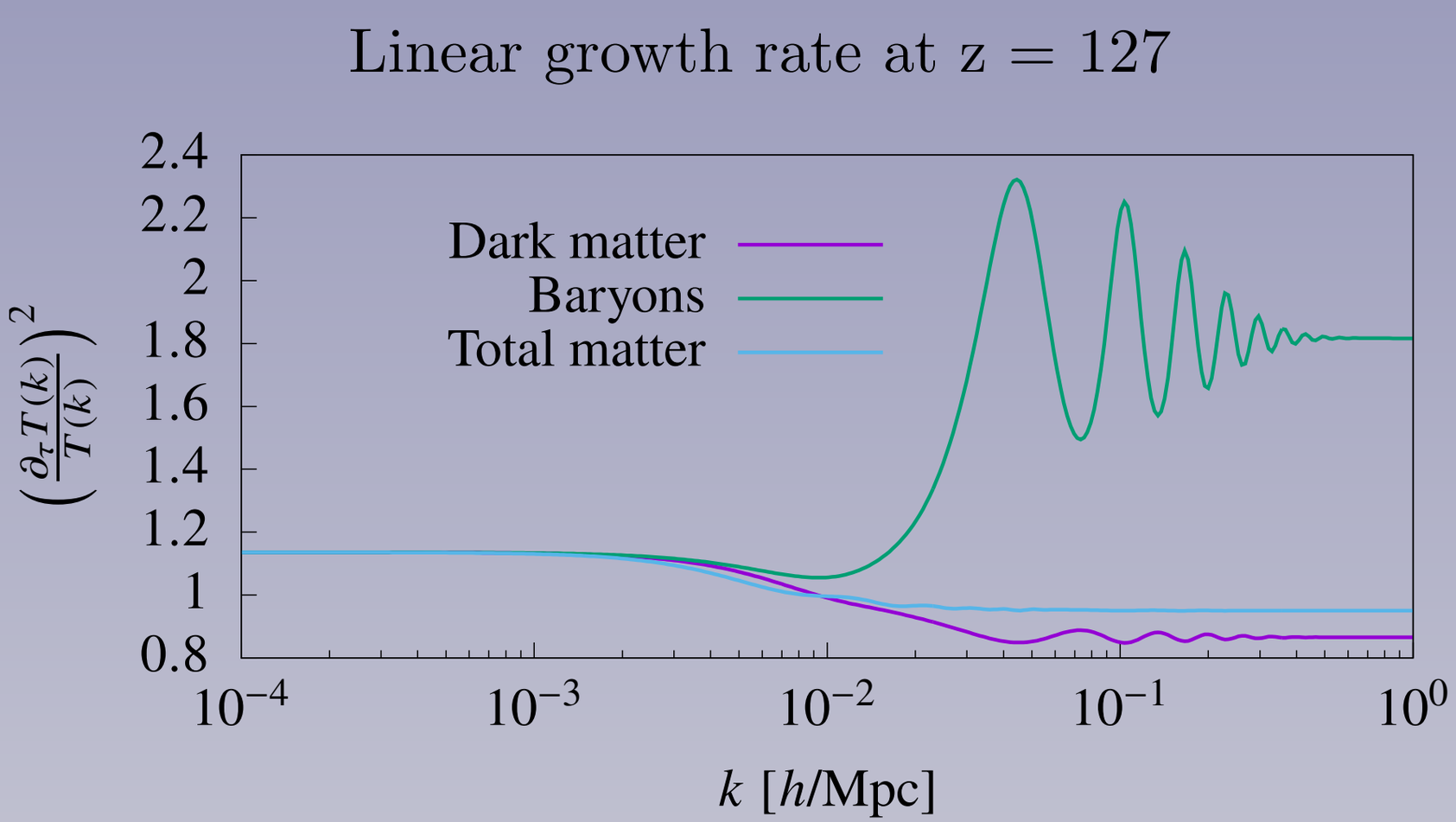
- Phenomena that demand DM
  - And of course
  - all recent LHC discoveries…

Oh, sorry about that.

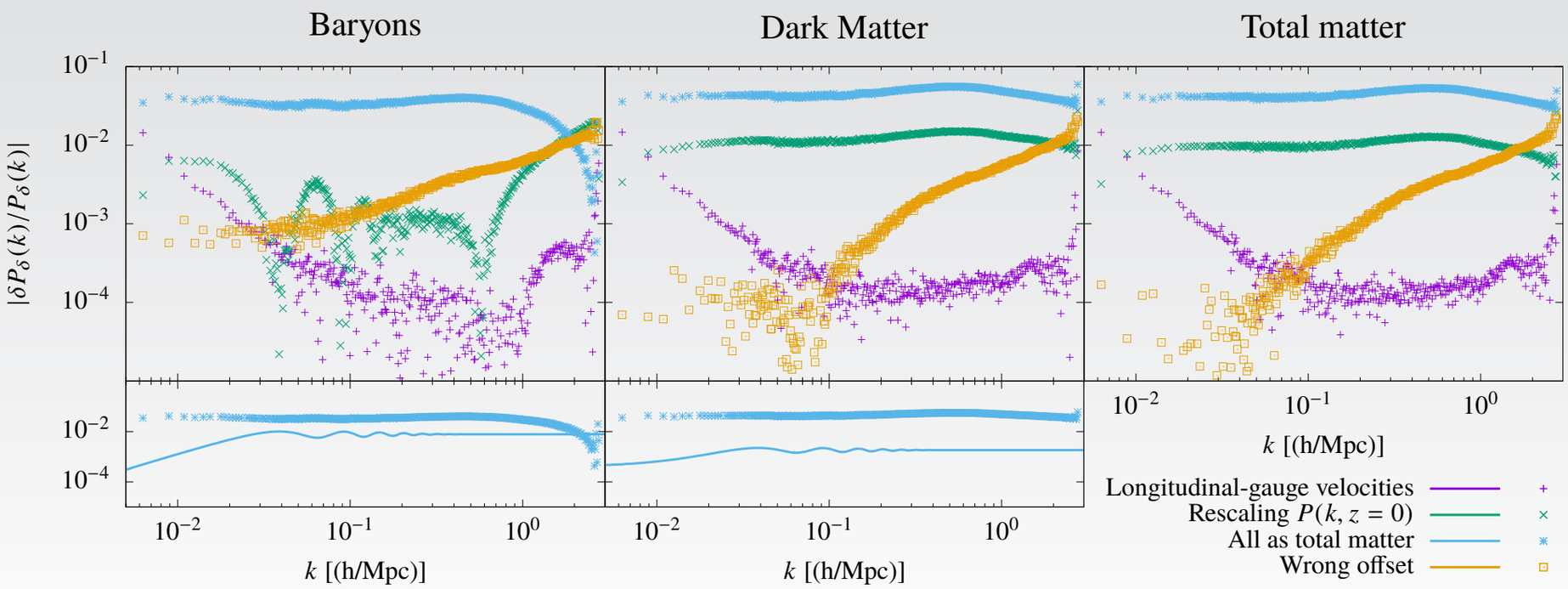
Dark Matter

- What I can and will contribute to DM research:
  - Currently: interface between (semi non-) linear theory and simulation
  - Dreams: simulate fully nonlinear evolution of arbitrarily interacting matter in General Relativity


Reference simulation
10^5
10^4
10^3
10^2
$P(k)$ [(Mpc/h)^3]
Dark Matter
Total Matter
Baryons
Linear theory
$z = 0$
Simulated
Linear theory
$z = 1$
$z = 9$
$z = 19$
1
0.9
0.8
$P_b(k)/P_{DM}(k)$
10^{-2}
10^{-1}
10^0
k [(h/Mpc)]

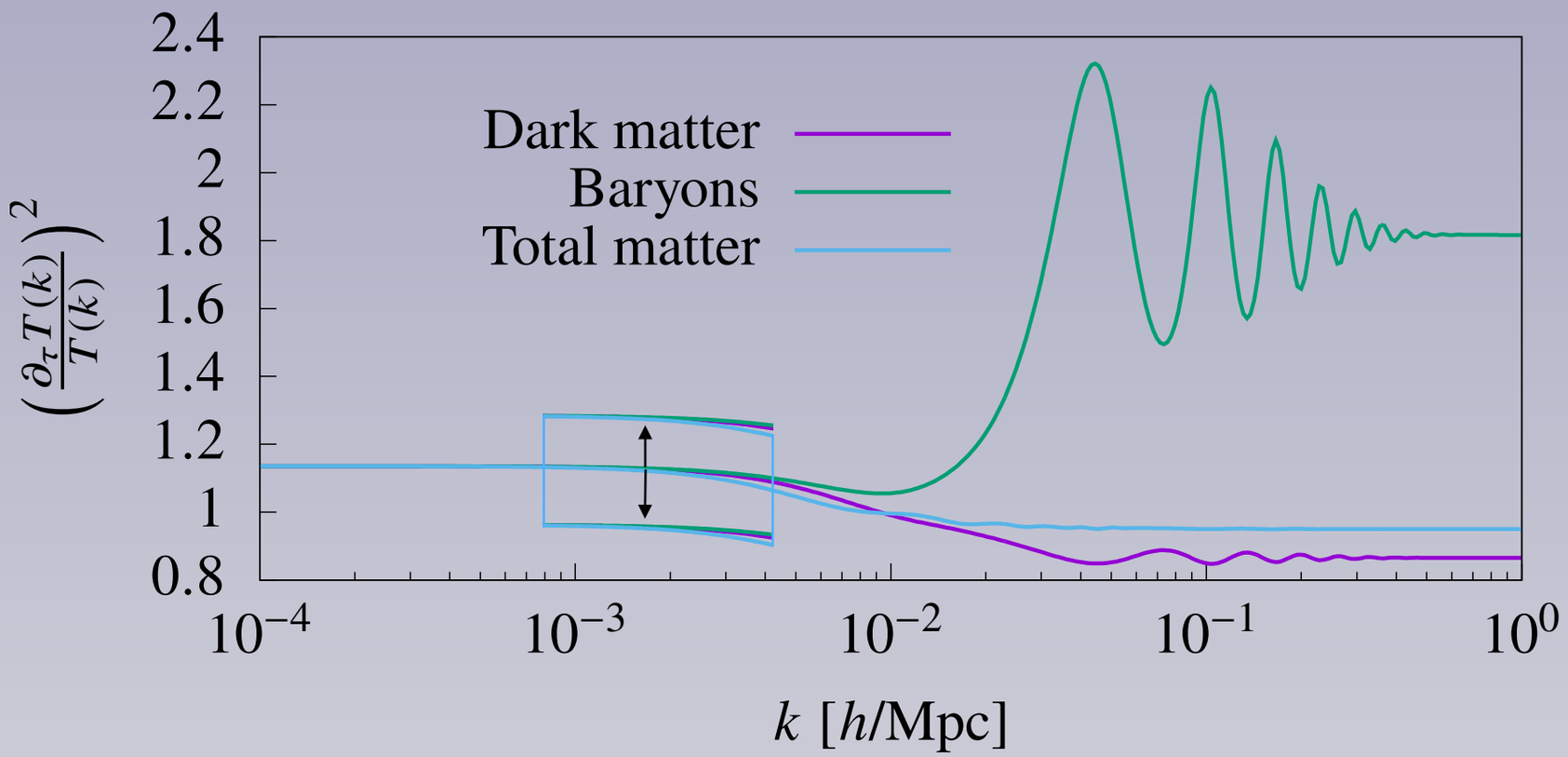

Linear growth rate at z = 127
$\left(\frac{\partial_\tau T(k)}{T(k)}\right)^2$
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
Dark matter
Baryons
Total matter
10^{-4}
10^{-3}
10^{-2}
10^{-1}
10^{0}
k [h/Mpc]

Errors in contemporary huge simulations (but not in mine!)



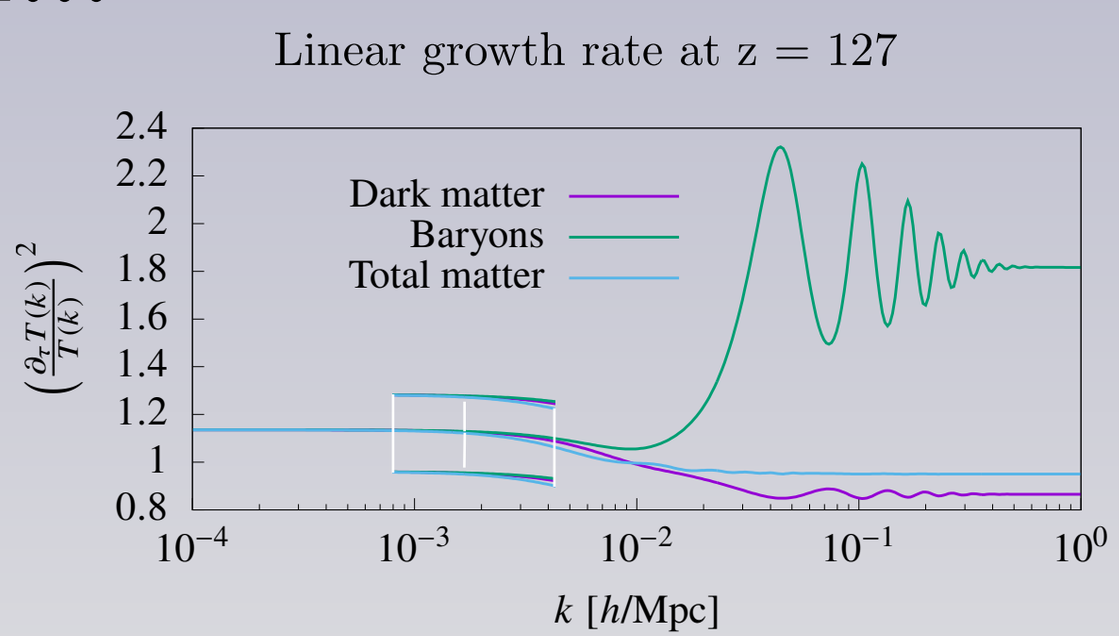
[Valkenburg & Villaescusa-Navarro]

Other project: more simulations of standard CDM



Other project:

- Reponse of nonlinear result to linear input
- Test for better understanding of nonlinearities
- Crucial for DM research...



So…

So…

- Dark Matter comes from cosmology

So…

- Dark Matter comes from cosmology
- I like to worry about the cosmology part of that sentence.

So…

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So…

- Dark Matter comes from cosmology
- I like to worry about the cosmology part of that sentence.

- Remember to invest in cosmology!