

News from the dark

MARSKILLE - La Corniche, Pointe de Maldormé et les Iles

Episode 9: OM vs. DM

Station Marine d'Endoume, Marseille

November 13-15 2024



GaDaMa

GREATDIGINTHESKY



Welcome !

News from the Dark:

- A series of mini-workshops bringing together people working on DM from different perspectives (th/ph/mdl oriented + obs/exp friendly).
- Limited size (~30 participants), on invitation, including young researchers.
- No fees, participation support when possible.
- Spirit: share state-of-the art devs, unveil the dust under rugs, identify ways to improve.
- Room for (friendly) discussion.

Funding:

- ANR project GaDaMa, ERC project GREATDIGINTHESKY, CNRS-INSU national programs PNHE/PNCG, LUPM, AMU.

This 9th edition (previous: Bruxelles, Montpellier, Annecy, etc.)

- Hosts: LAM + CPPM (extra-funding from the hosting labs)
- LOC: Emmanuel Nezri (LAM) et al.
- SOC: Francesca Calore (Annecy), Benoit Famaey (Strasbourg), JL (Montpellier), Emmanuel Nezri (Marseille), Patrick Valageas (Saclay).
- NB: small last-minute changes in program (check indico).

Practical

WIFI:

- Eduroam active.
- Ask Emmanuel (aka Manu)

Coffee breaks:

- Dedicated room.

Lunches (offered to participants):

- In situ, individual lunchboxes.

Dinner on Thursday evening (offered to participants):

- Restaurant “Chez Jeannot”, address on the indico website.

Questions?

- Practical: Ask Manu.
- Others: Francesca, Benoit, Julien, Manu, Patrick.

Episode 9: OM vs. DM



DM on small scales: connecting fundamental unknowns

Origin of cosmological perturbations

→ Primordial power spectrum (PS)

(on scales much lower than CMB can touch)

Nature and origin of dark matter

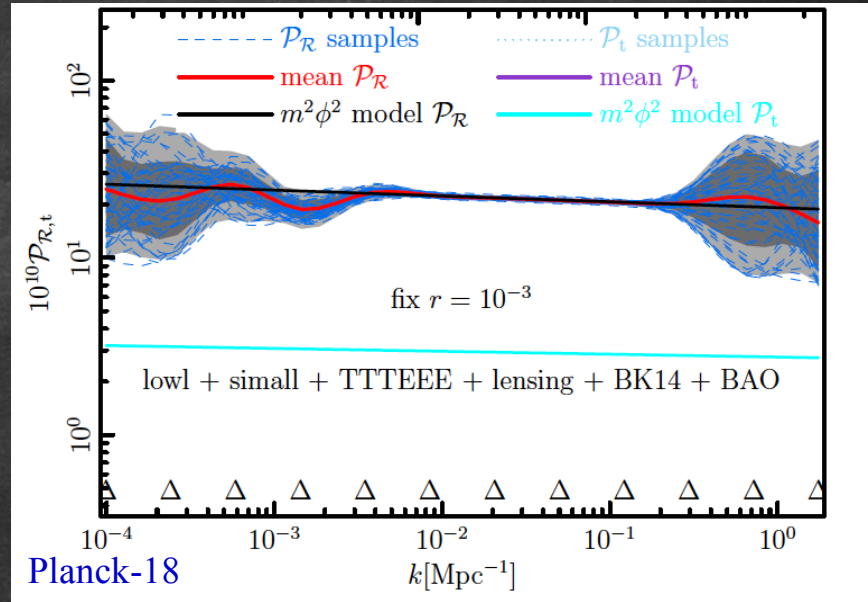
- DM responds to primordial perturbations (matter PS)
- It imprints its own features (interactions, etc.)
- Might even generate additional perturbations
- Smallest dark structures carry invaluable information

DM on small scales: connecting fundamental unknowns

Origin of cosmological perturbations

→ Primordial power spectrum (PS)

(on scales much lower than CMB can touch)



Nature and origin of dark matter

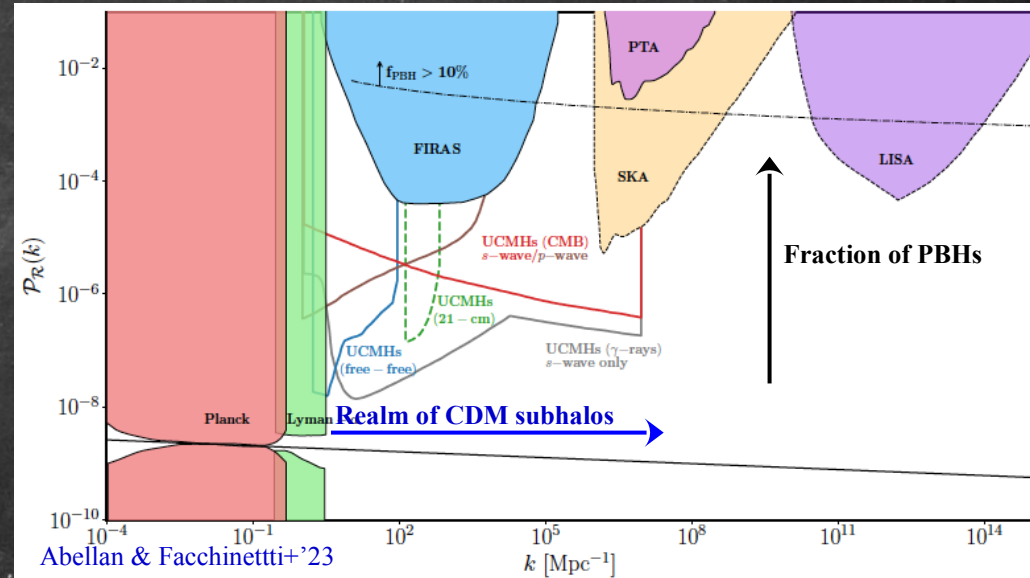
- DM responds to primordial perturbations (matter PS)
- It imprints its own features (interactions, etc.)
- Might even generate additional perturbations
- Smallest dark structures carry invaluable information

DM on small scales: connecting fundamental unknowns

Origin of cosmological perturbations

→ Primordial power spectrum (PS)

(on scales much lower than CMB can touch)



Nature and origin of dark matter

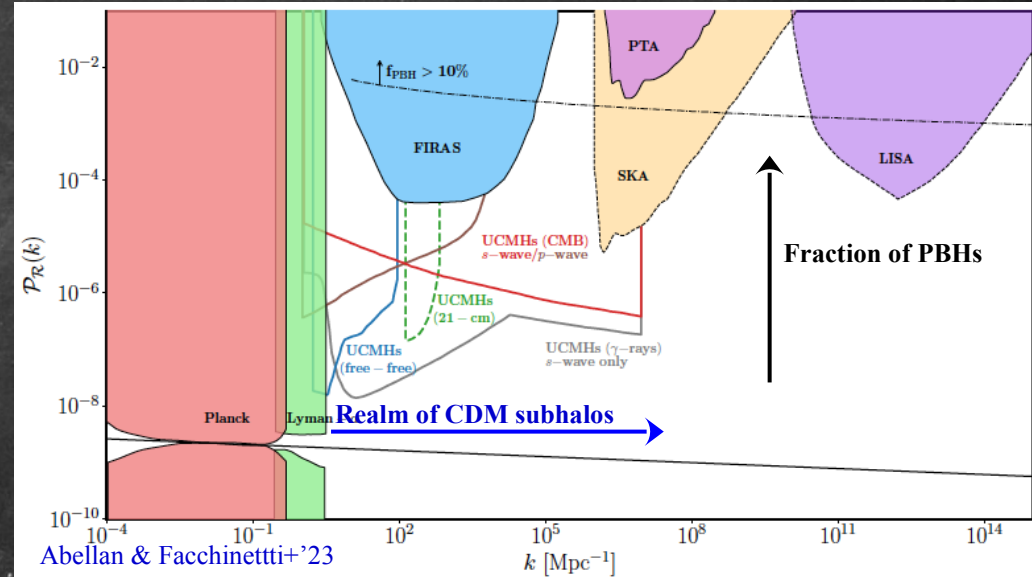
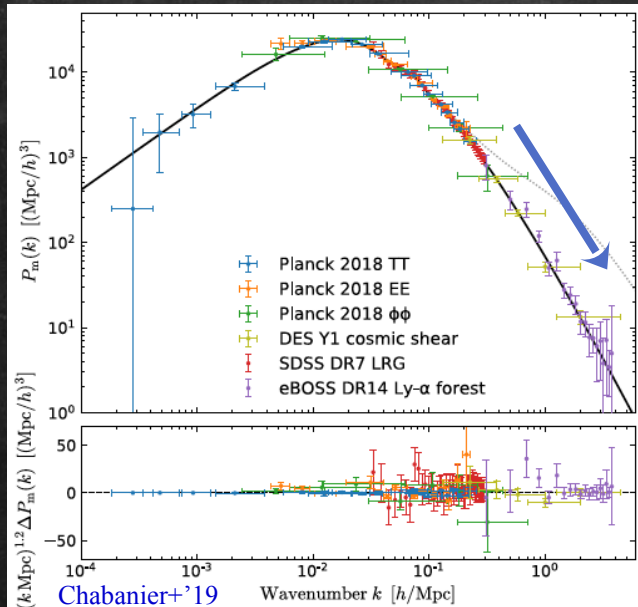
- DM responds to primordial perturbations (matter PS)
- It imprints its own features (interactions, etc.)
- Might even generate additional perturbations
- Smallest dark structures carry invaluable information

DM on small scales: connecting fundamental unknowns

Origin of cosmological perturbations

→ Primordial power spectrum (PS)

(on scales much lower than CMB can touch)



Nature and origin of dark matter

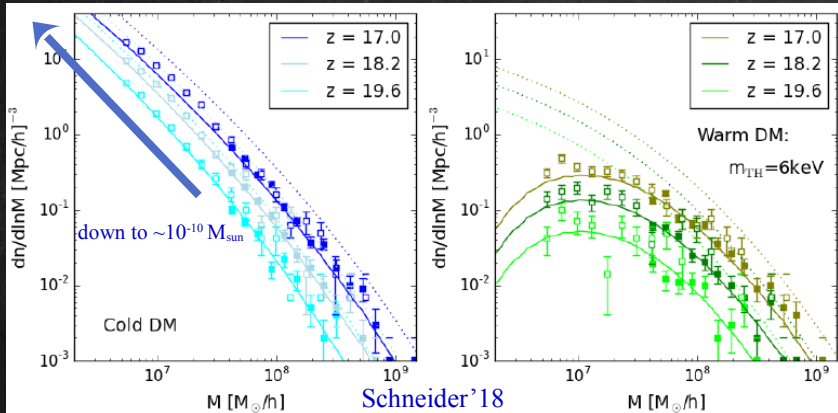
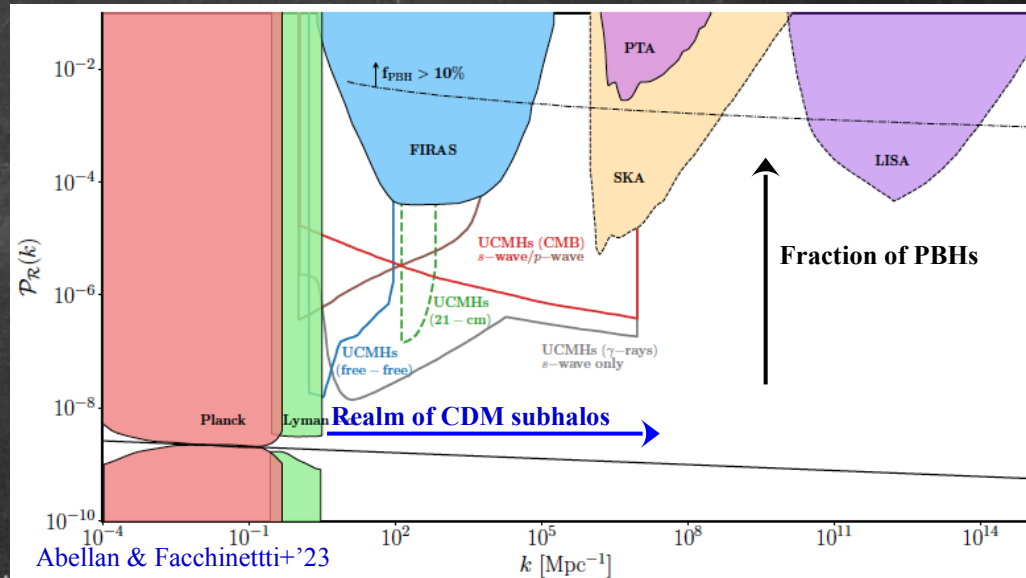
- DM responds to primordial perturbations (matter PS)
- It imprints its own features (interactions, etc.)
- Might even generate additional perturbations
- Smallest dark structures carry invaluable information

DM subhalos: connecting fundamental unknowns

Origin of cosmological perturbations

→ Primordial power spectrum (PS)

(on scales much lower than CMB can touch)



Nature and origin of dark matter

- DM responds to primordial perturbations (matter PS)
- It imprints its own features (interactions, etc.)
- Might even generate additional perturbations
- Smallest dark structures carry invaluable information

Discussion topics



Via Lactea 2 – Diemand+'08

(non-exclusive) focus on dark matter on small scales

- Scenarios of DM: new particles vs others (PBHs, etc.)
- Dark matter nature vs structure formation: UL-axion-like, SIDM vs CDM (e.g. WIMPs, QCD axions, PBHs).
- Baryonic feedback: a solution to issues on small scales?
- Constraining distribution of DM: dynamics, lensing, etc.
- Probes of dark matter: searches + current constraints.
- Other cosmological/astrophysical aspects.

Enjoy!