

# Learning about the ISM from Nuclear Decay Lines

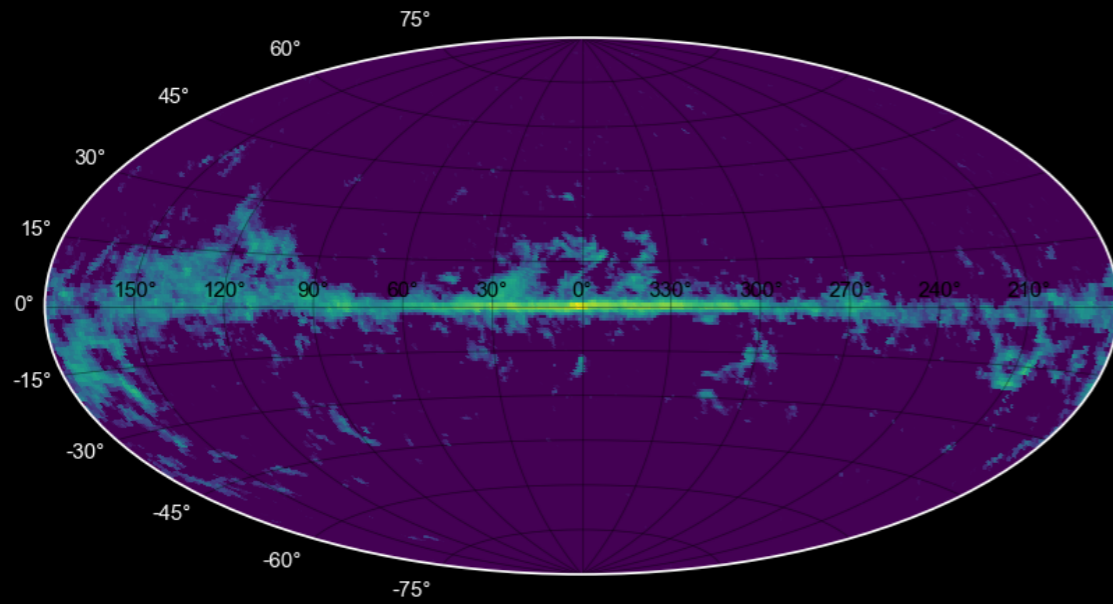
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Moritz Pleintinger  
([mpleinti@mpe.mpg.de](mailto:mpleinti@mpe.mpg.de))

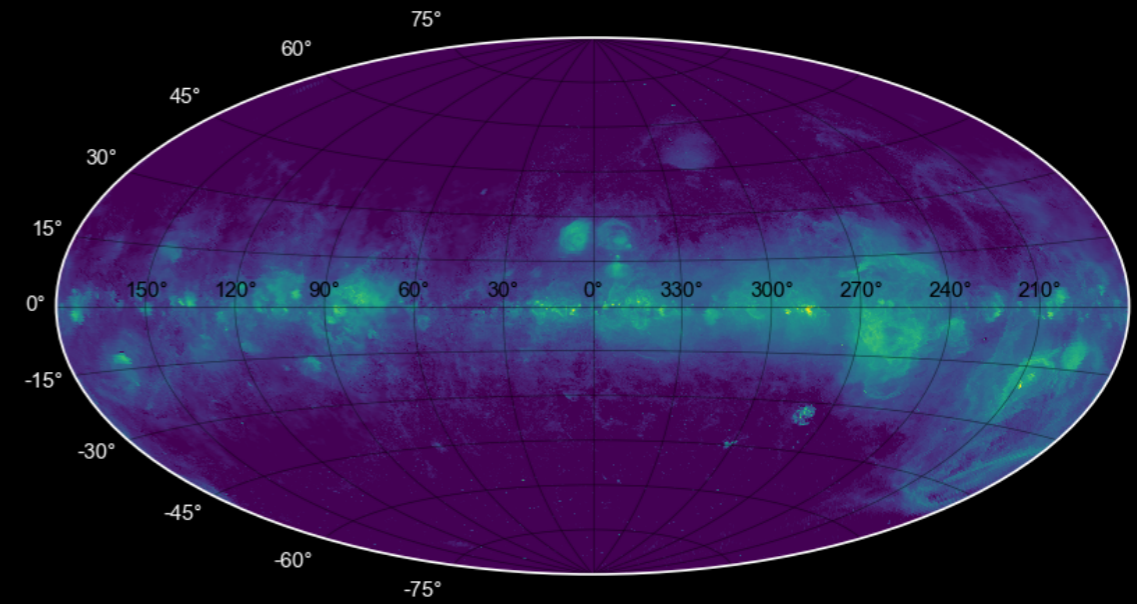
Max Planck Institute for Extraterrestrial Physics (MPE), Garching

# How We Learn about the ISM

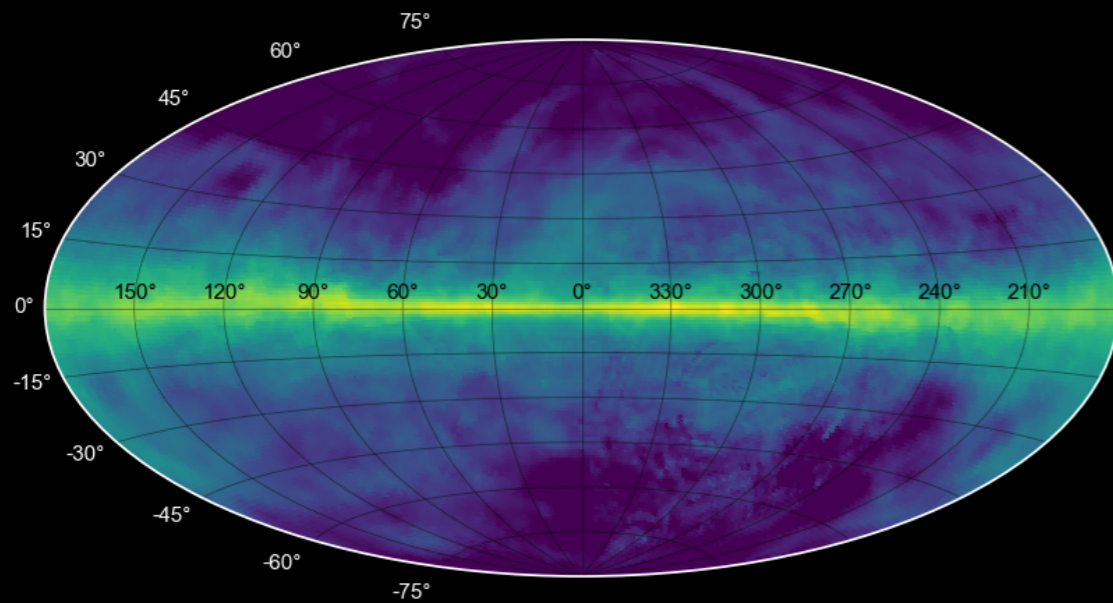
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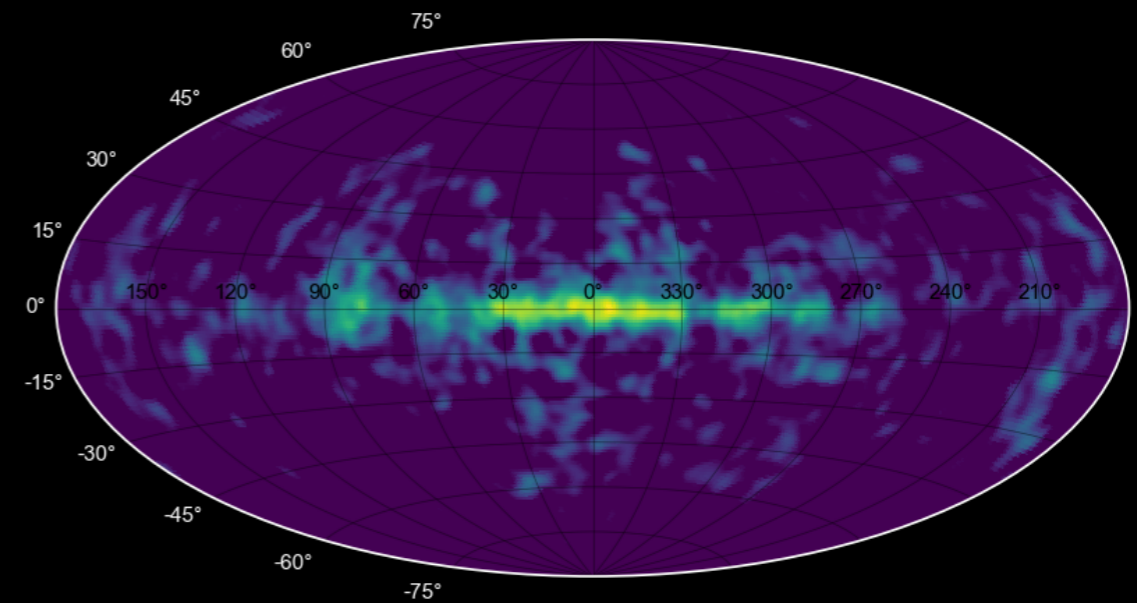
H $\alpha$



HI

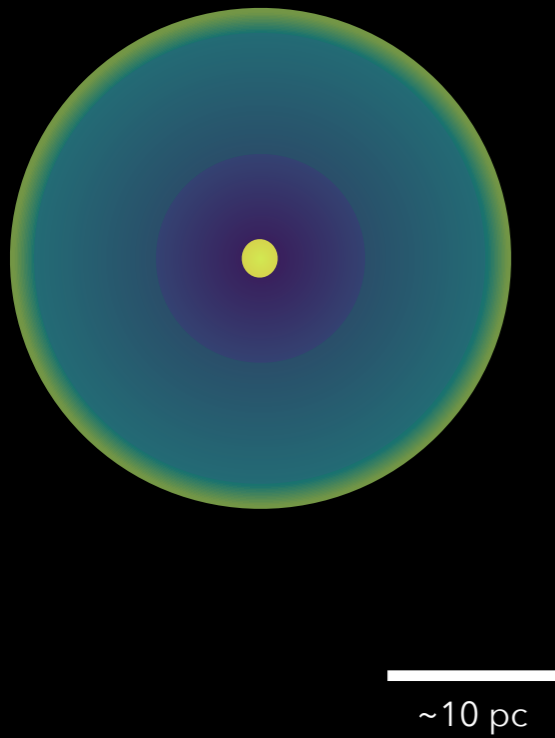


$^{26}\text{Al}$

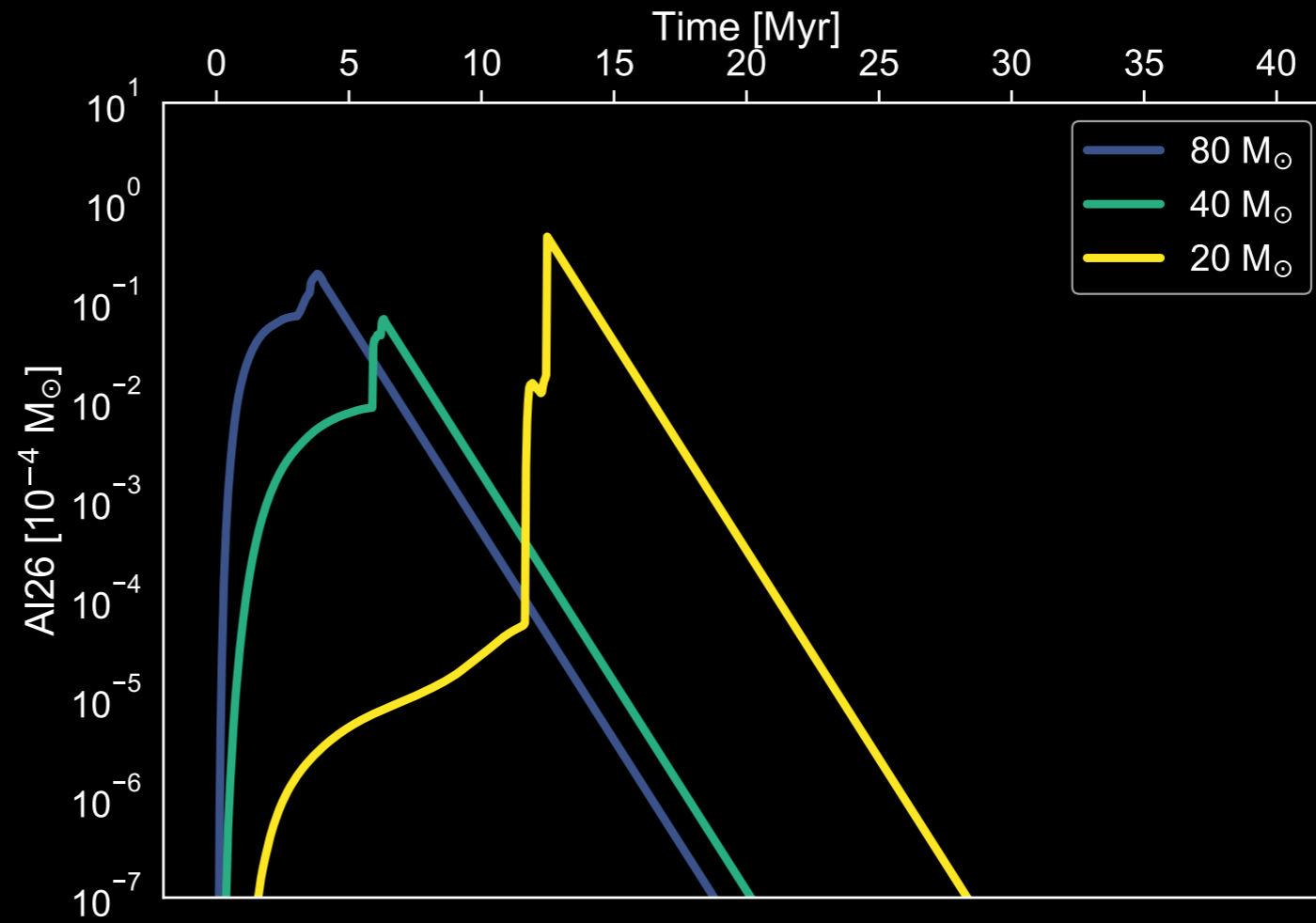


# How We Learn about the ISM

Single Star



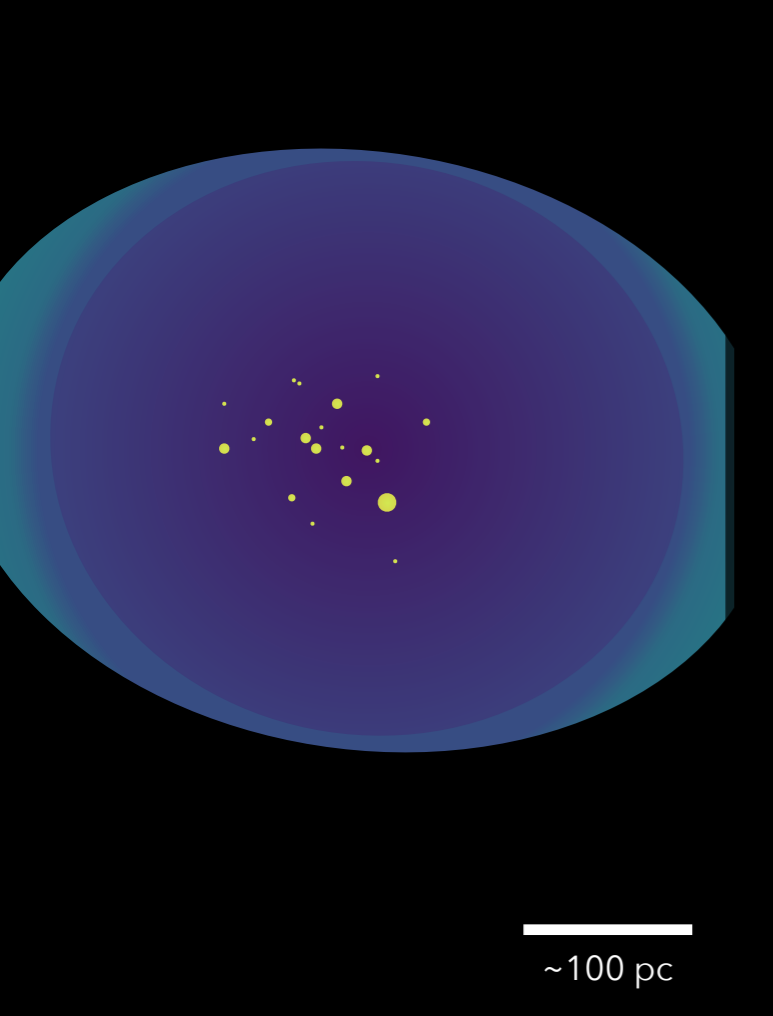
$^{26}\text{Al}$



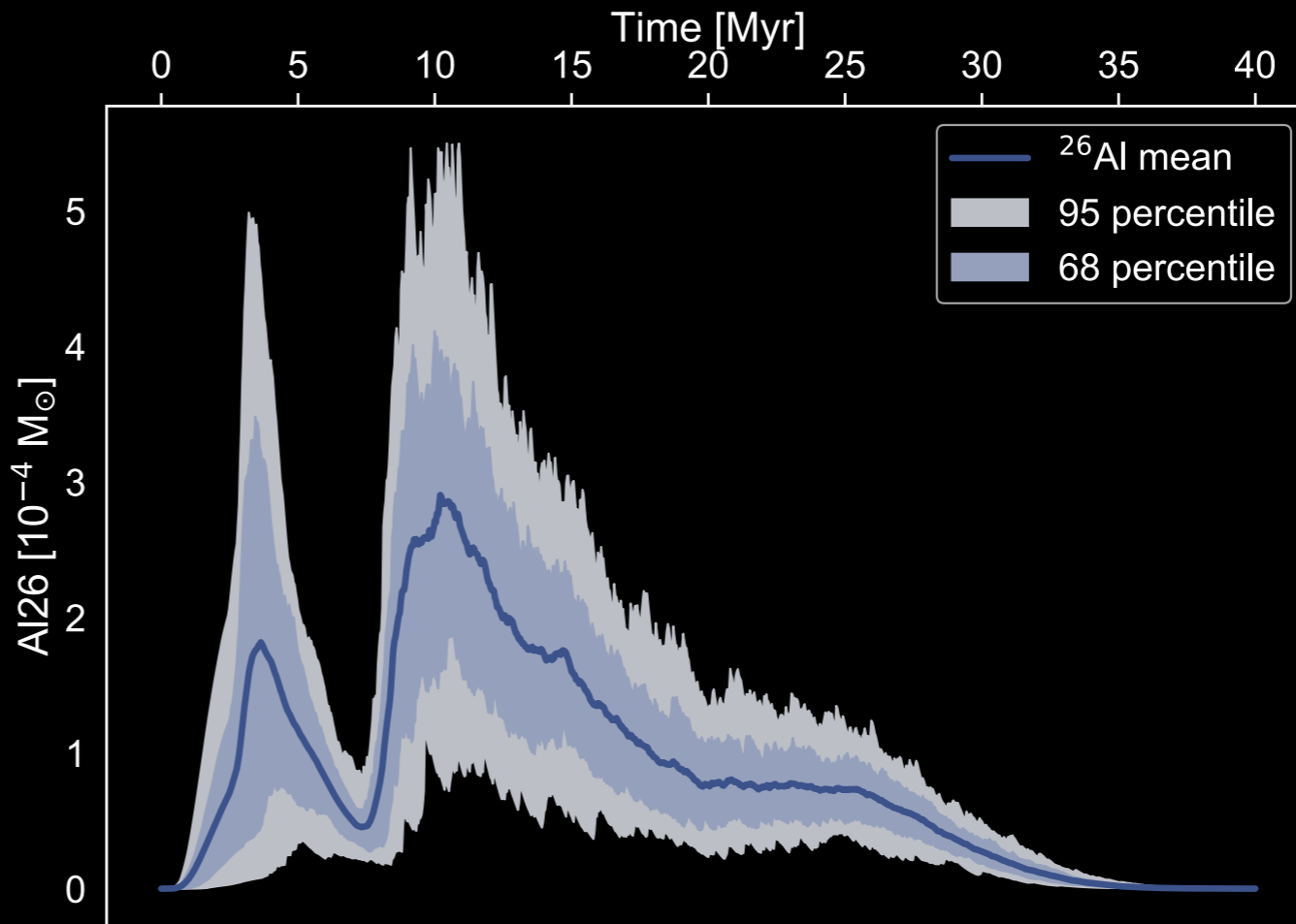
Limongi & Chieffi (2018)

# How We Learn about the ISM

Superbubble

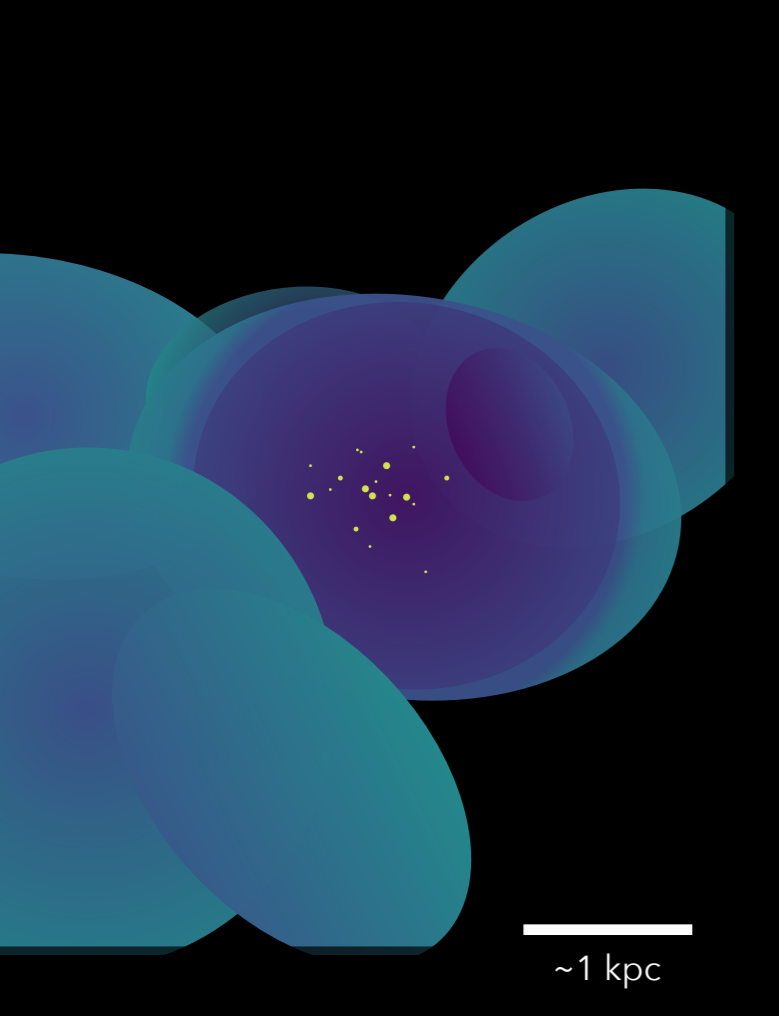


Population Synthesis

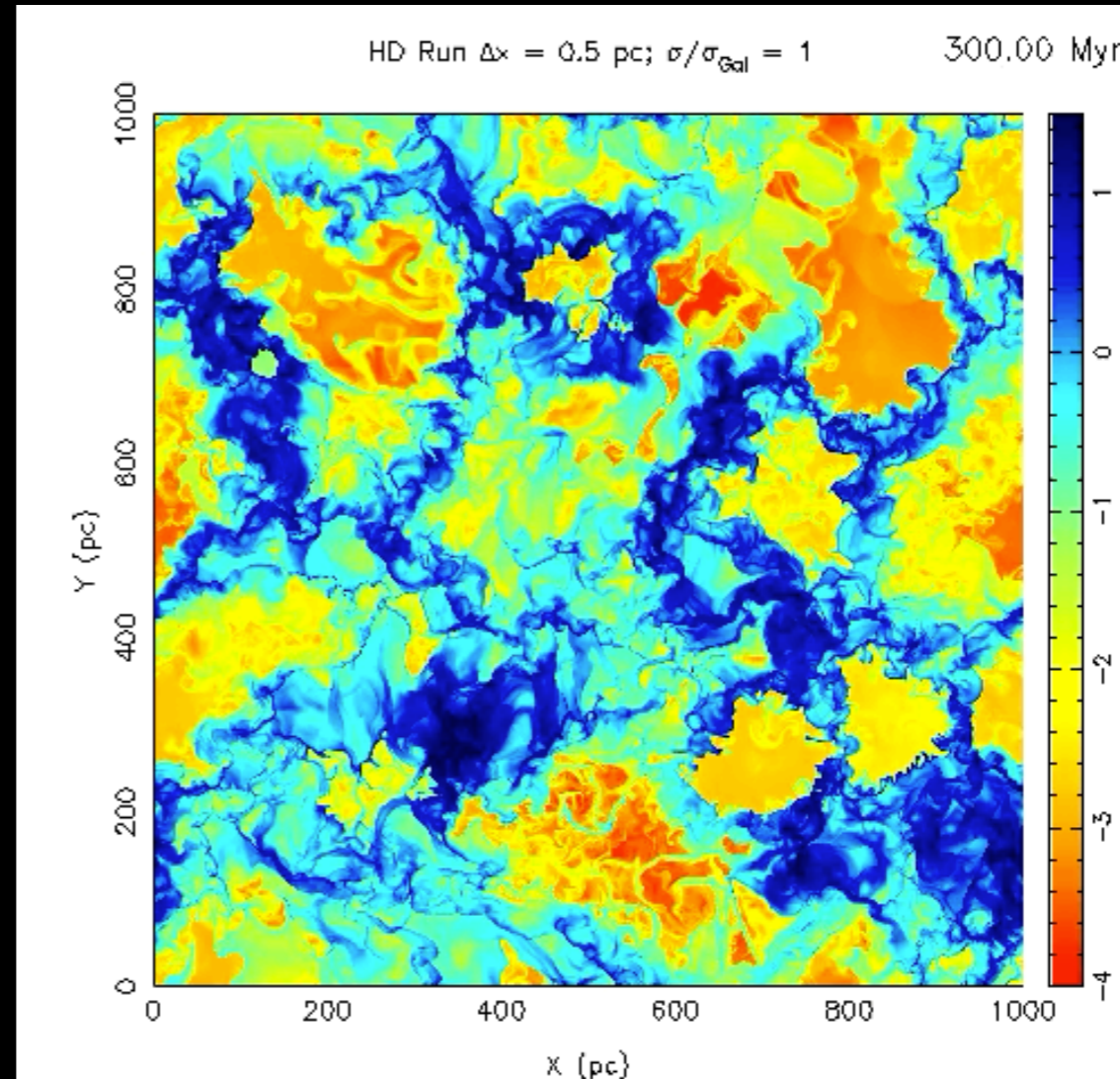


# How We Learn about the ISM

Bubble Interactions



MHD Simulation

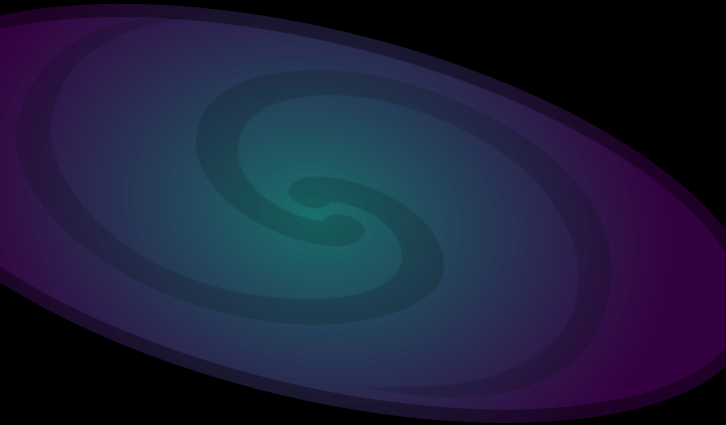


de Avillez & Breitschwerdt (2005)

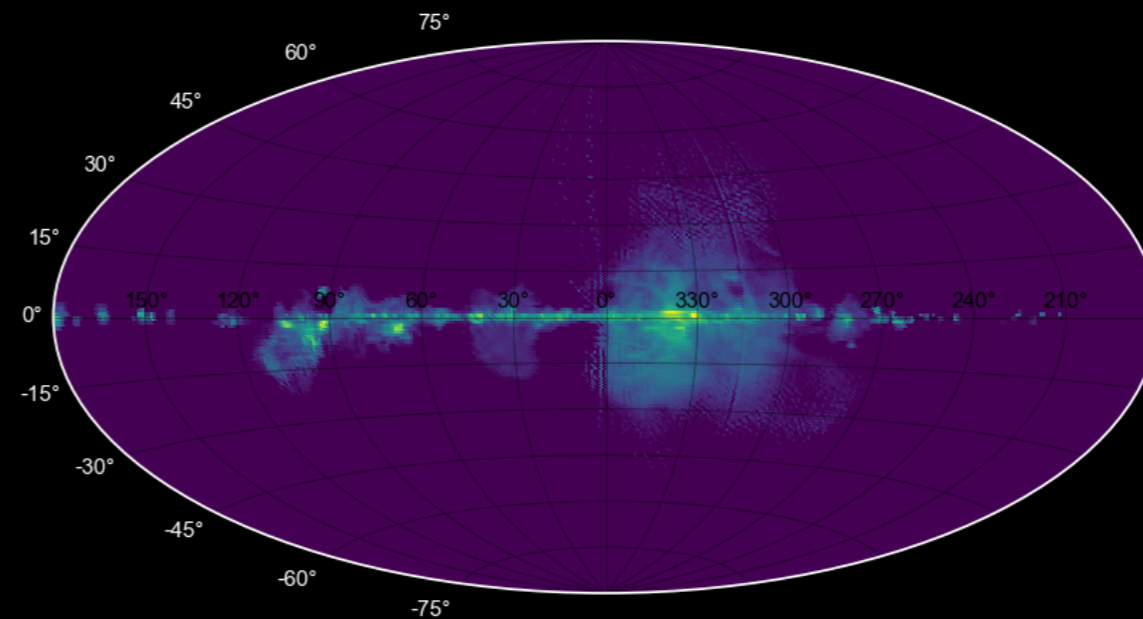
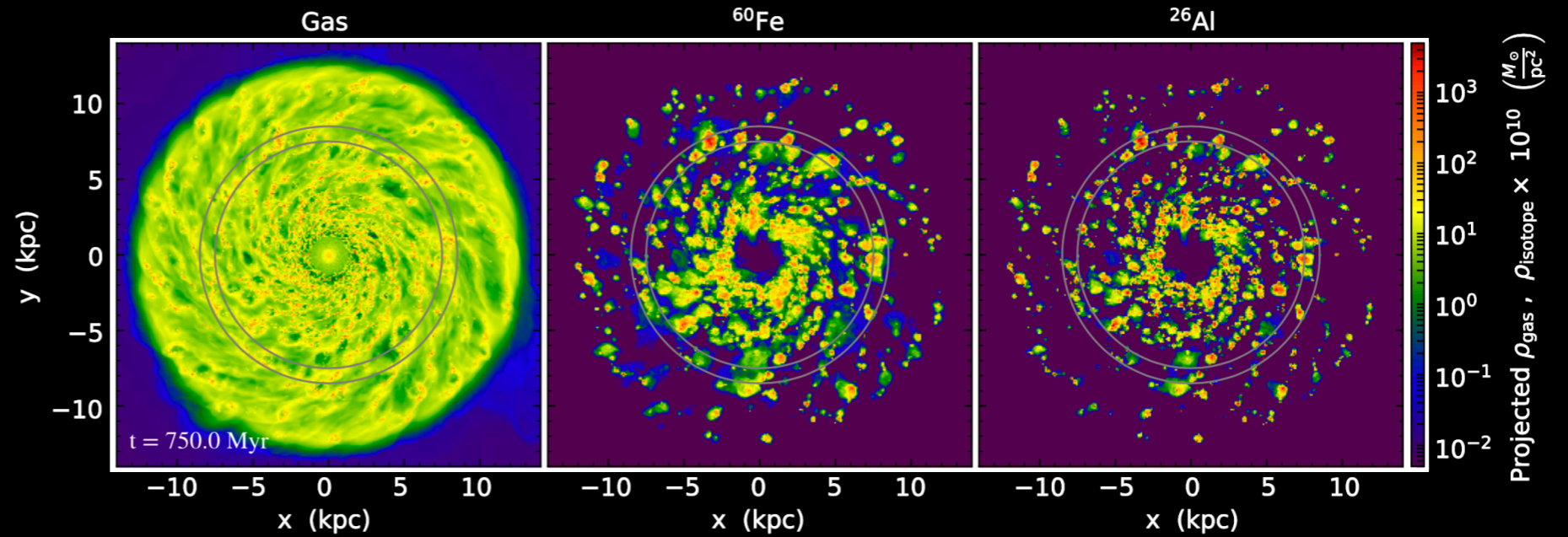
# How We Learn about the ISM

Galaxy

Galaxy Simulation

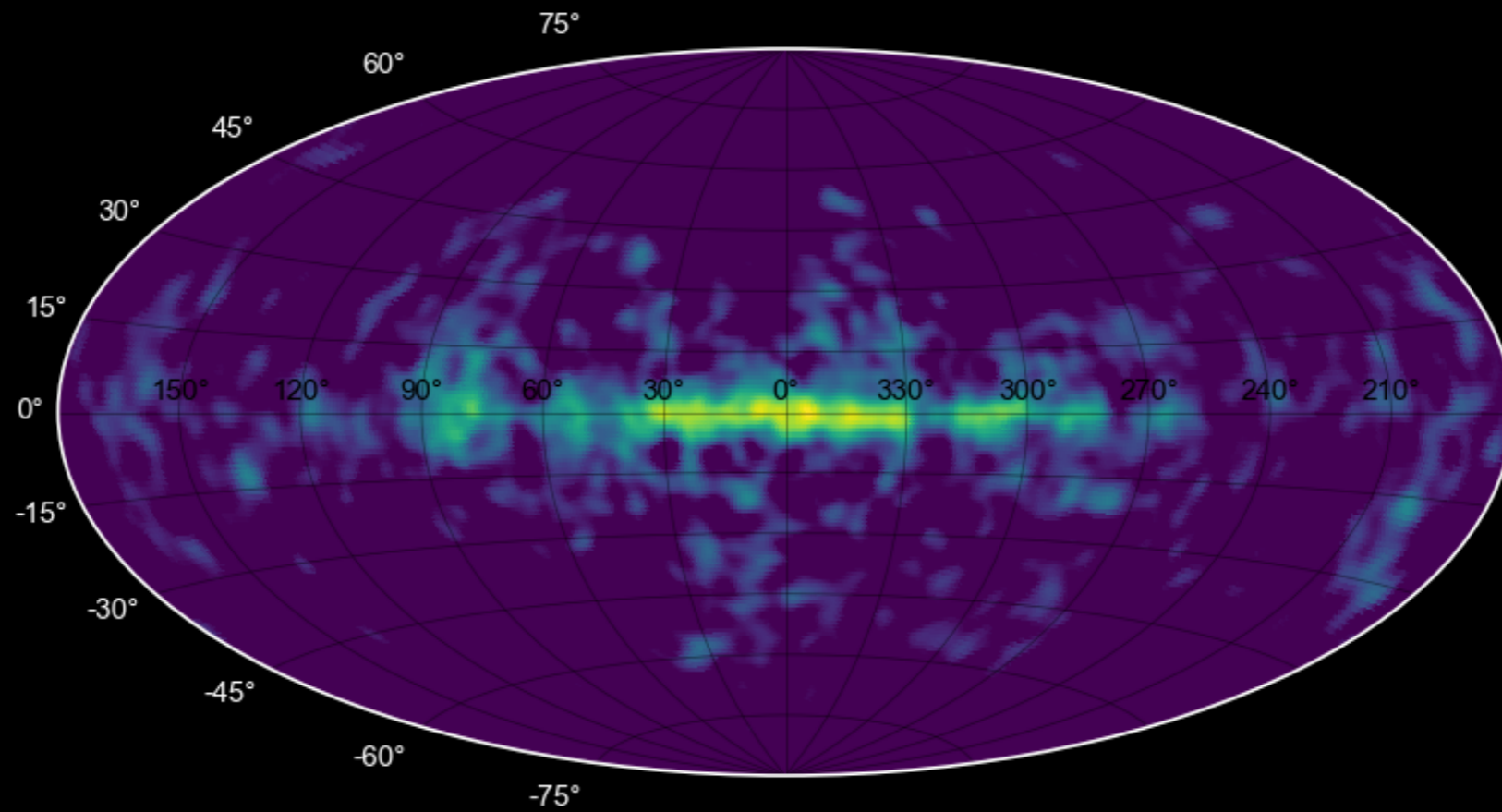


~10 kpc



Fujimoto et al. (2018)

# How We Learn about the ISM

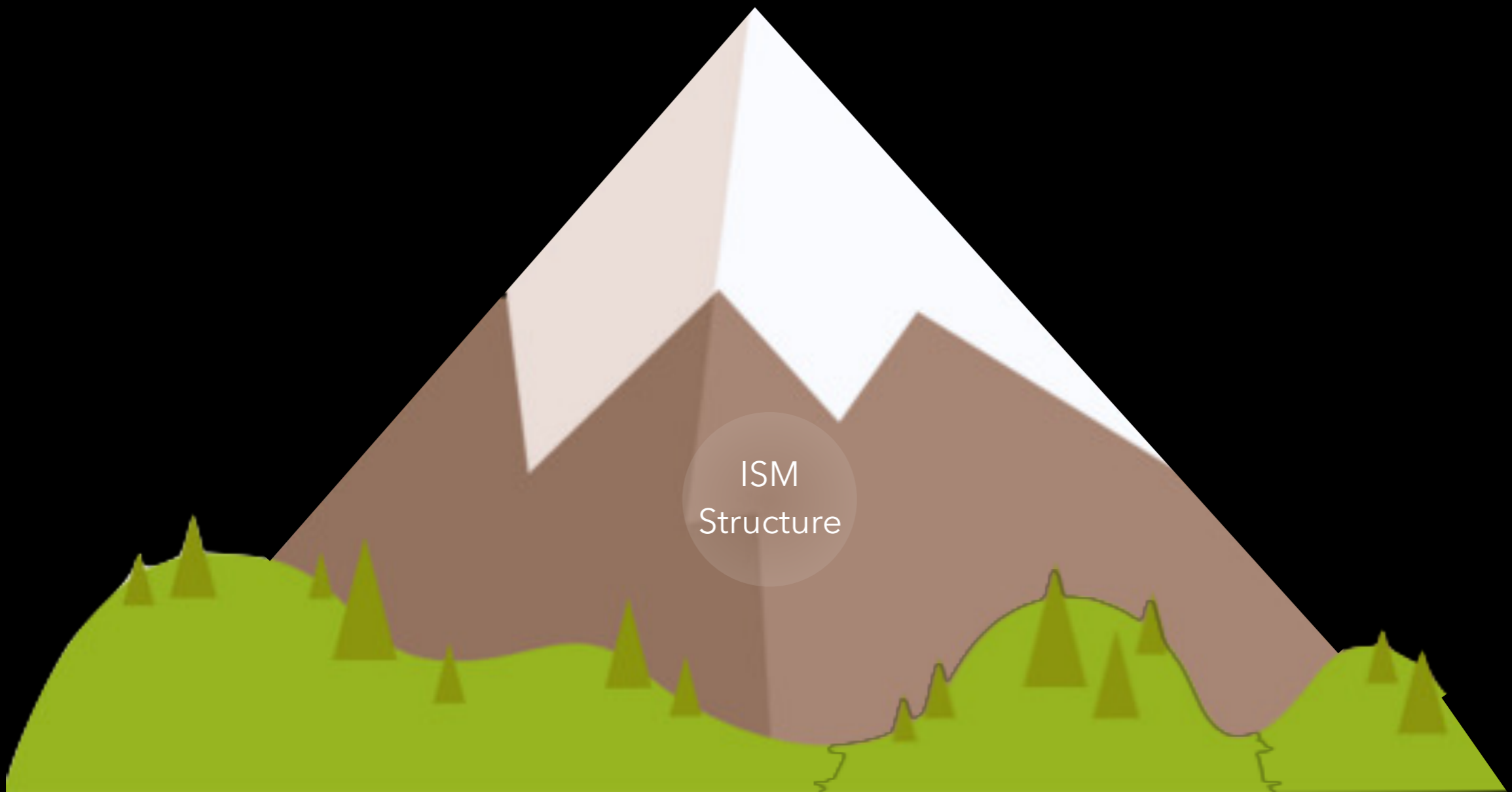


COMPTEL 1.8 MeV

# Comparison of Simulations with Observations

Theory

Observation

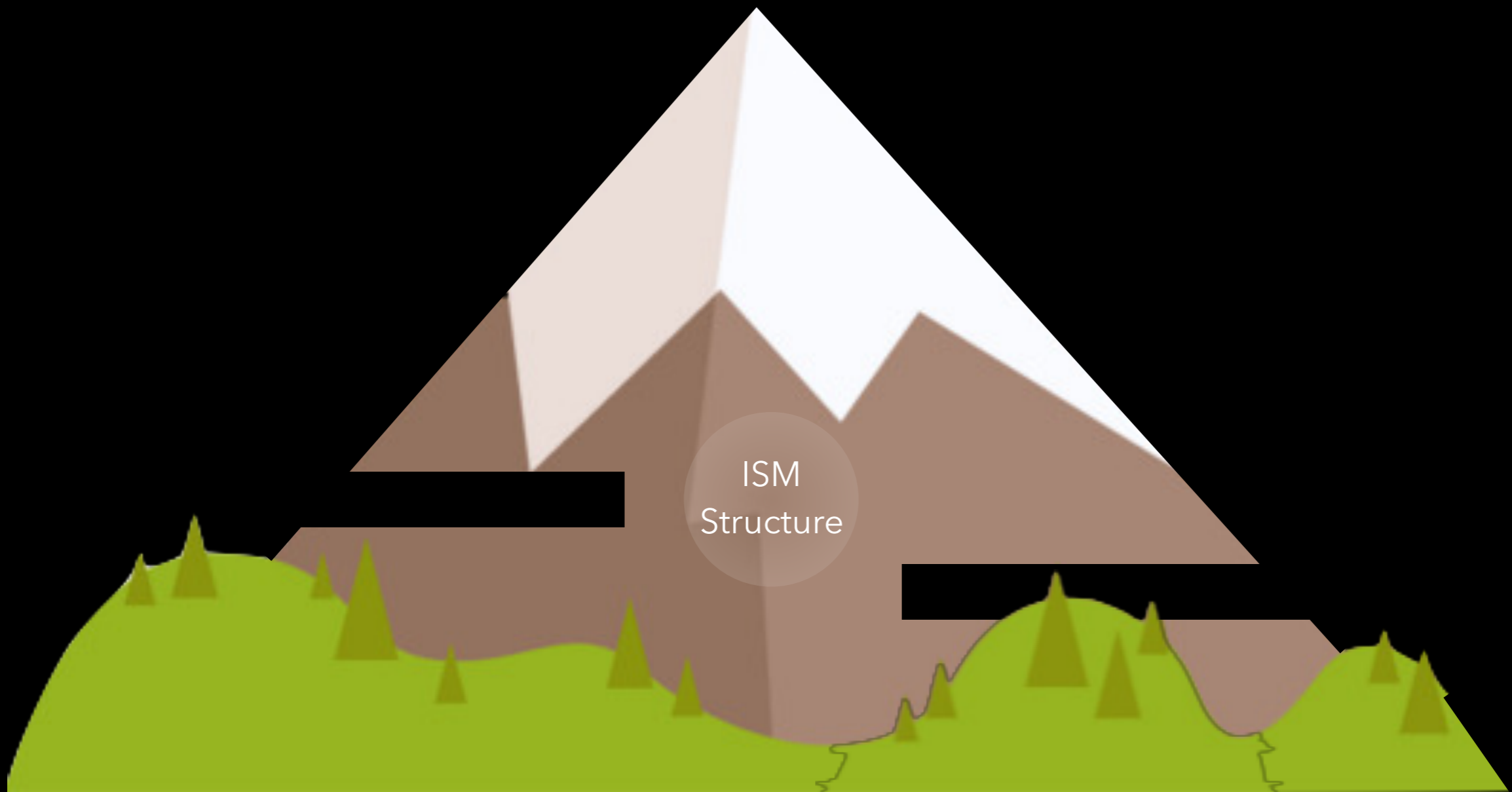


ISM  
Structure

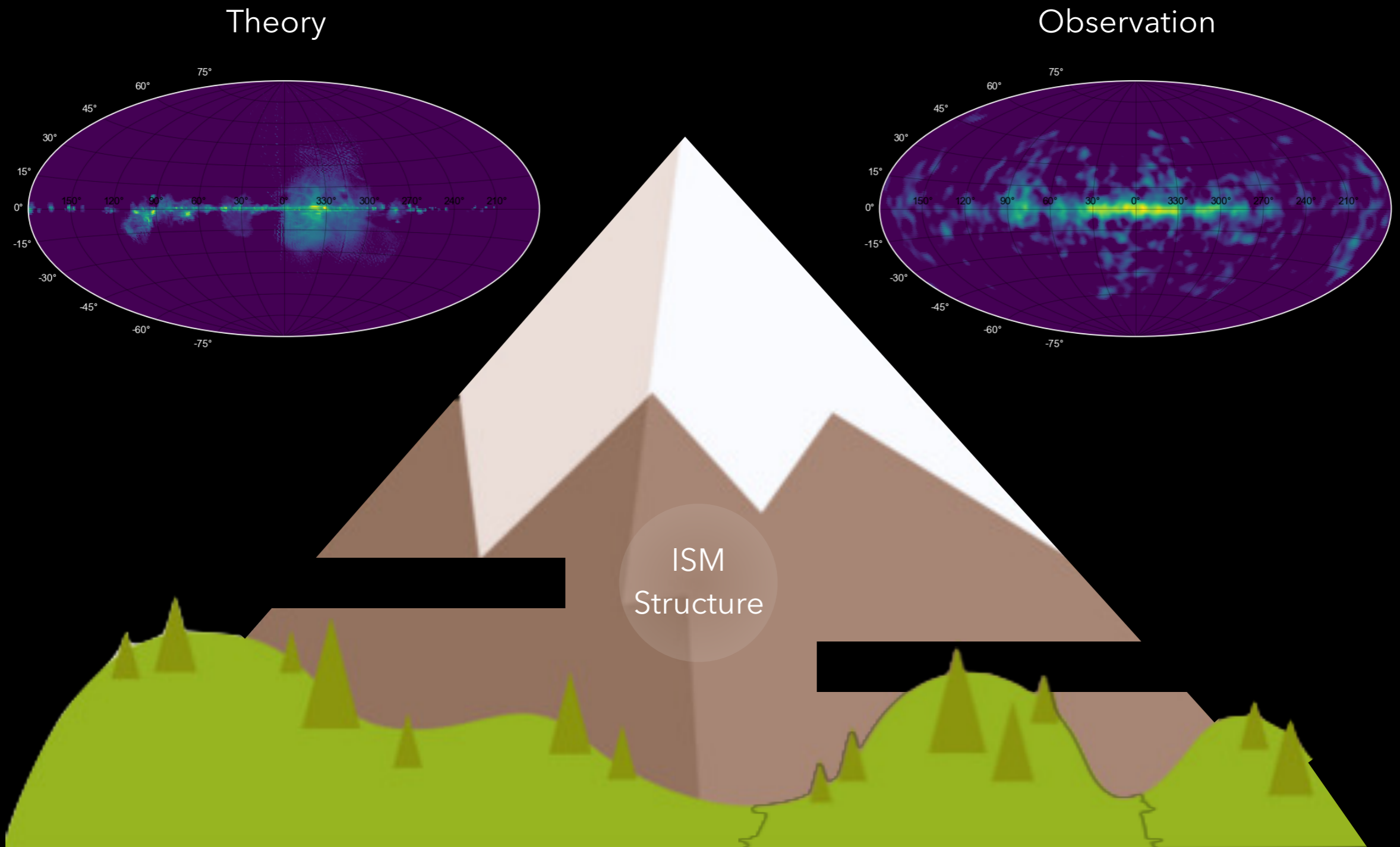
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Theory

Observation



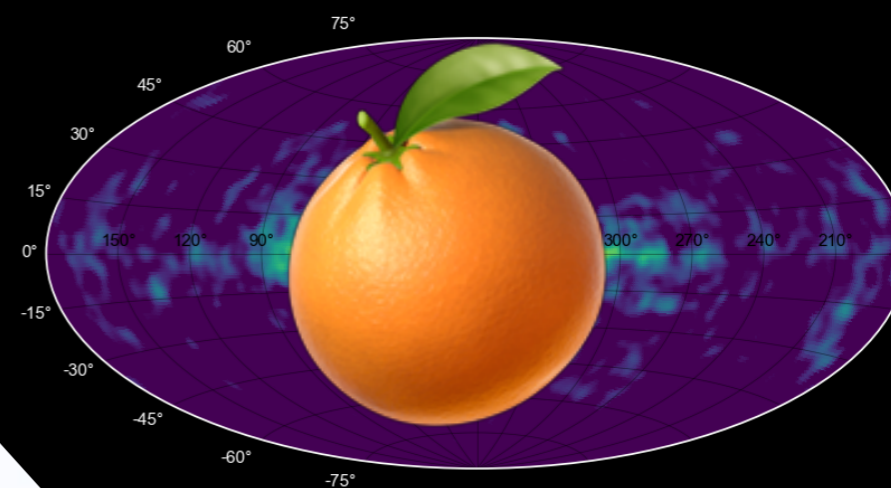
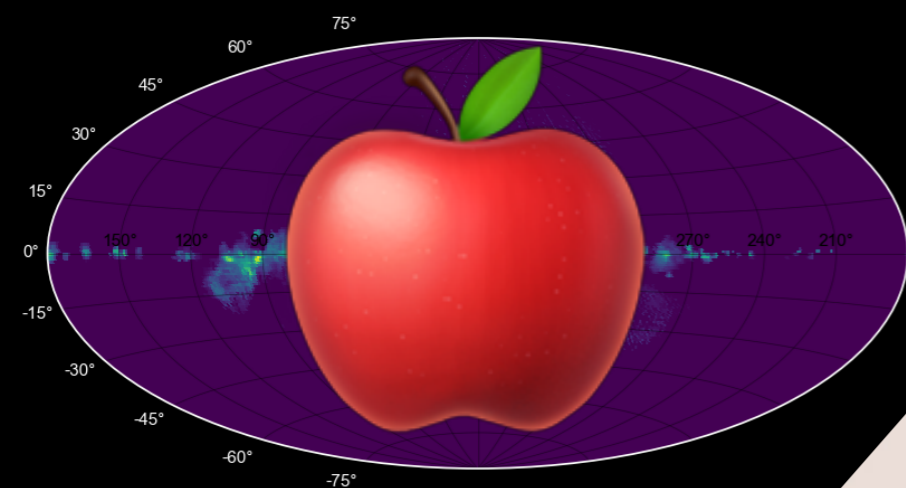
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Theory

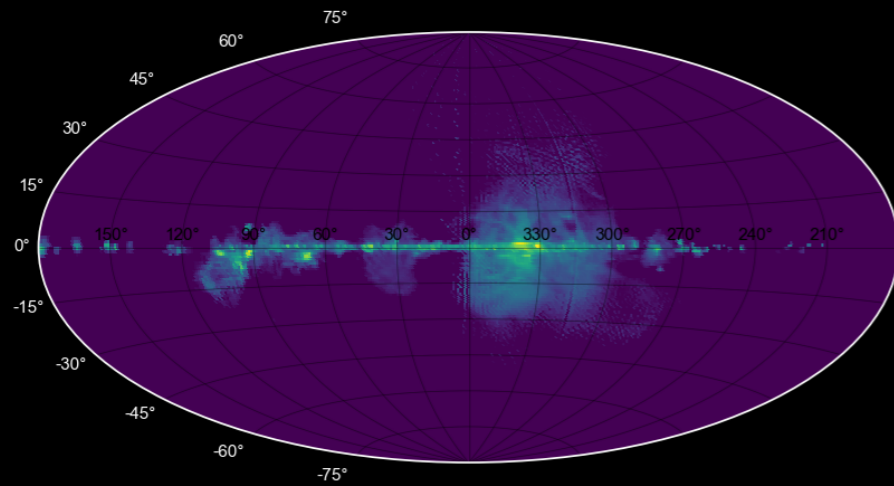
Observation



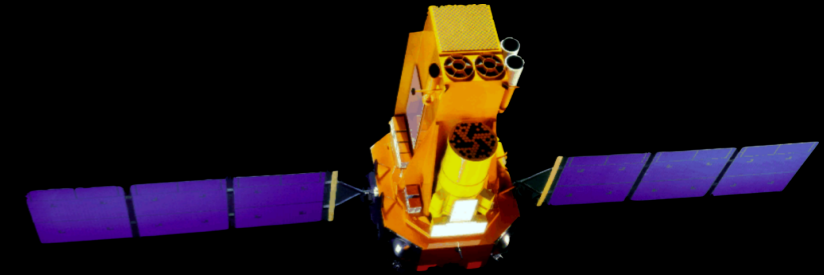
ISM  
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Theory



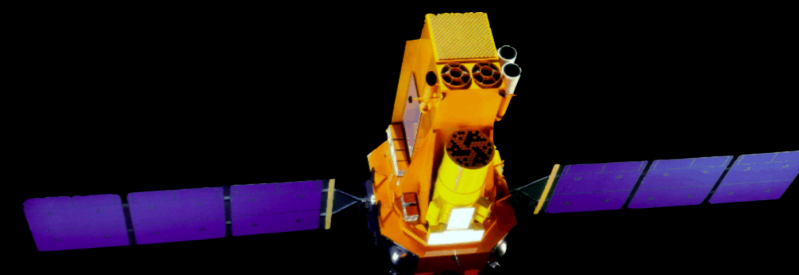
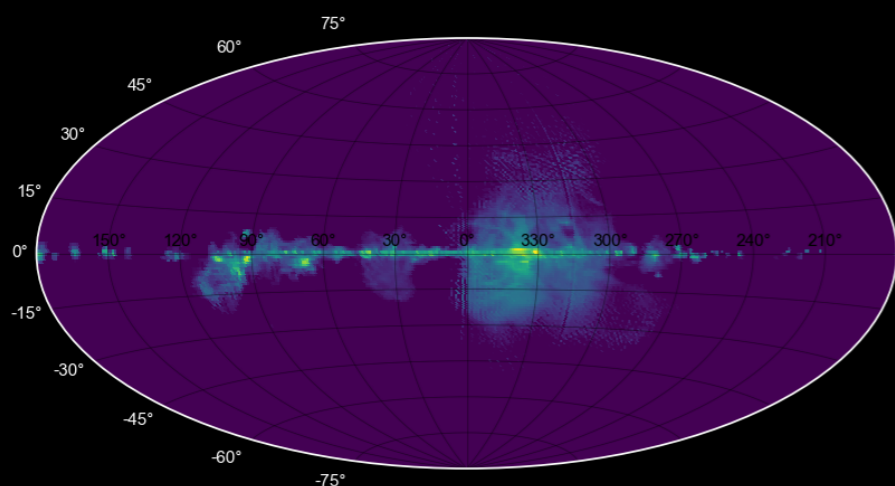
Observation



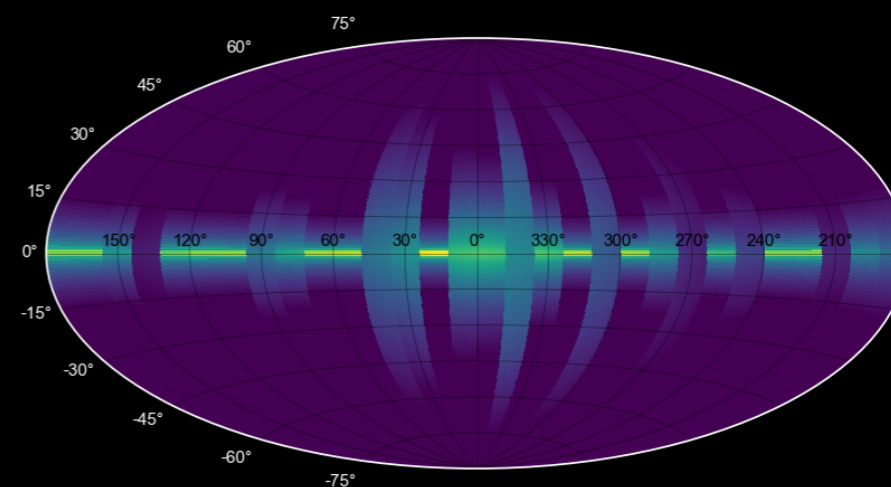
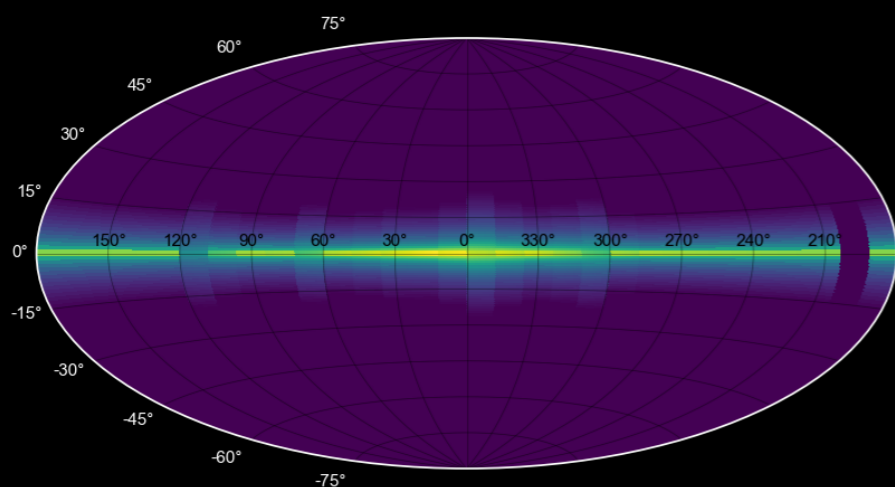
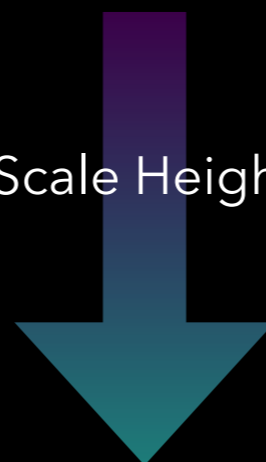
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Theory

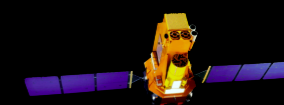
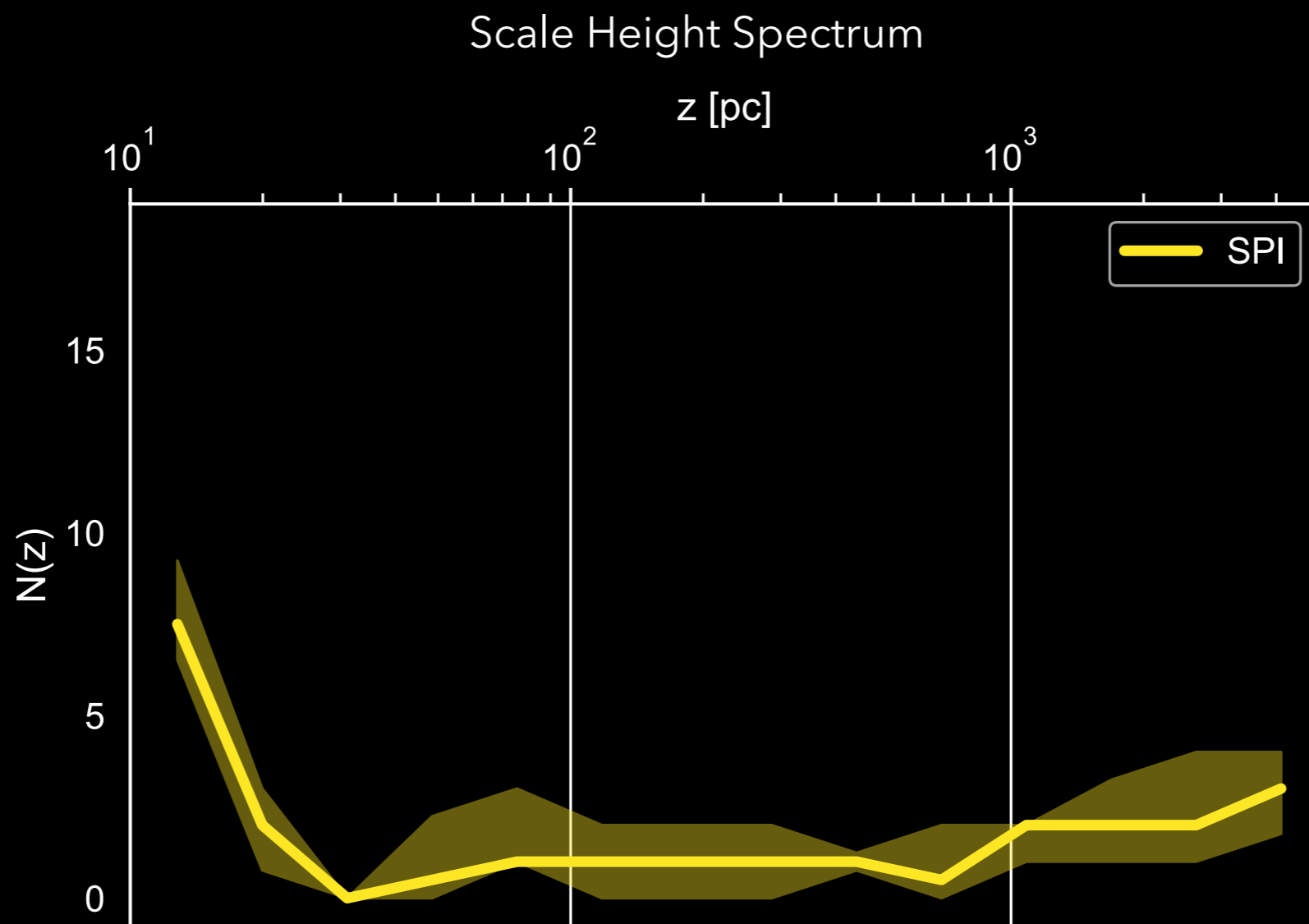
Observation



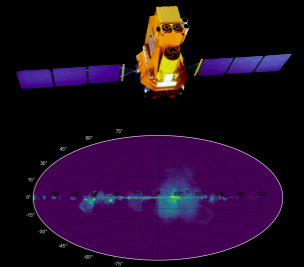
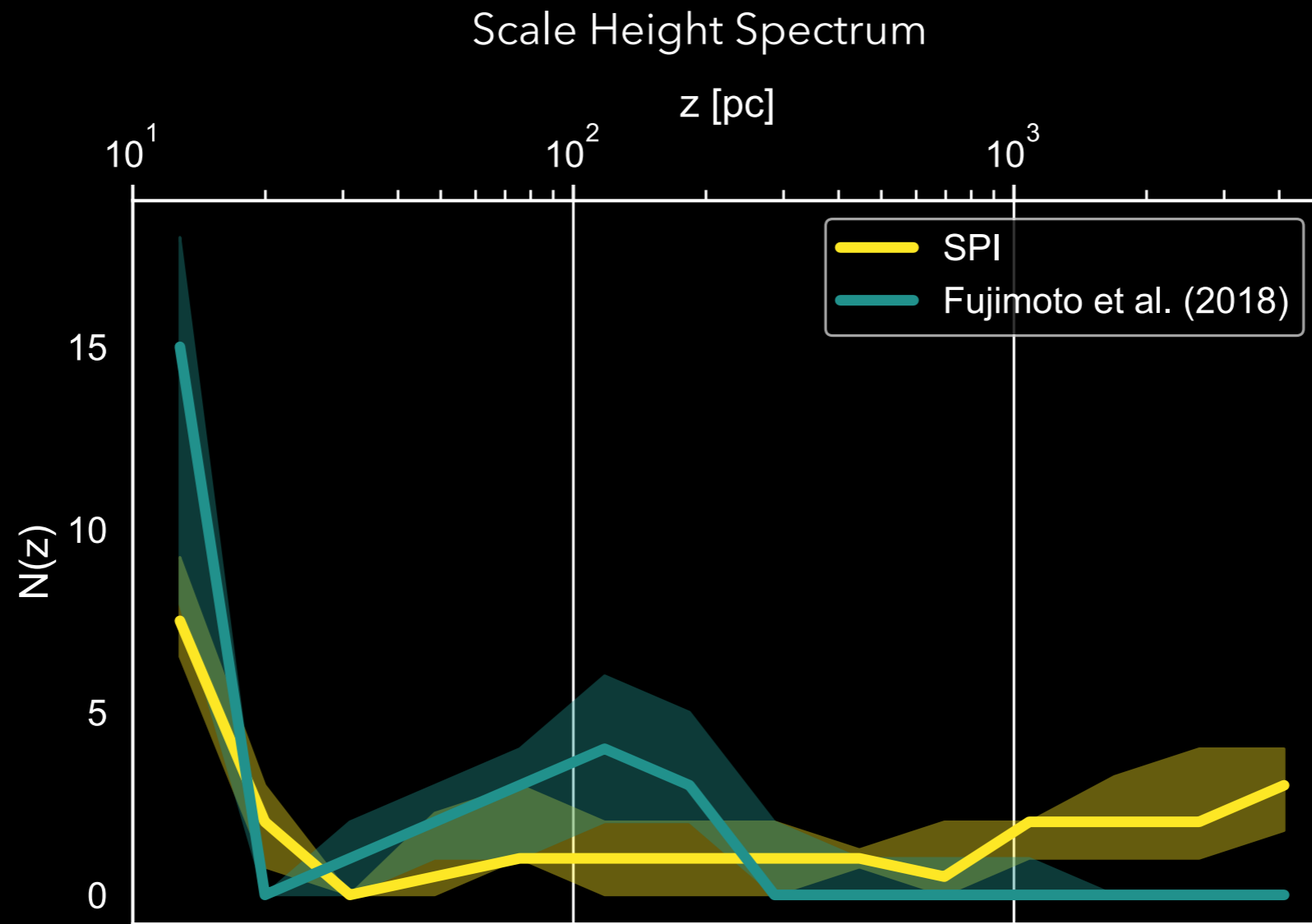
Scale Height



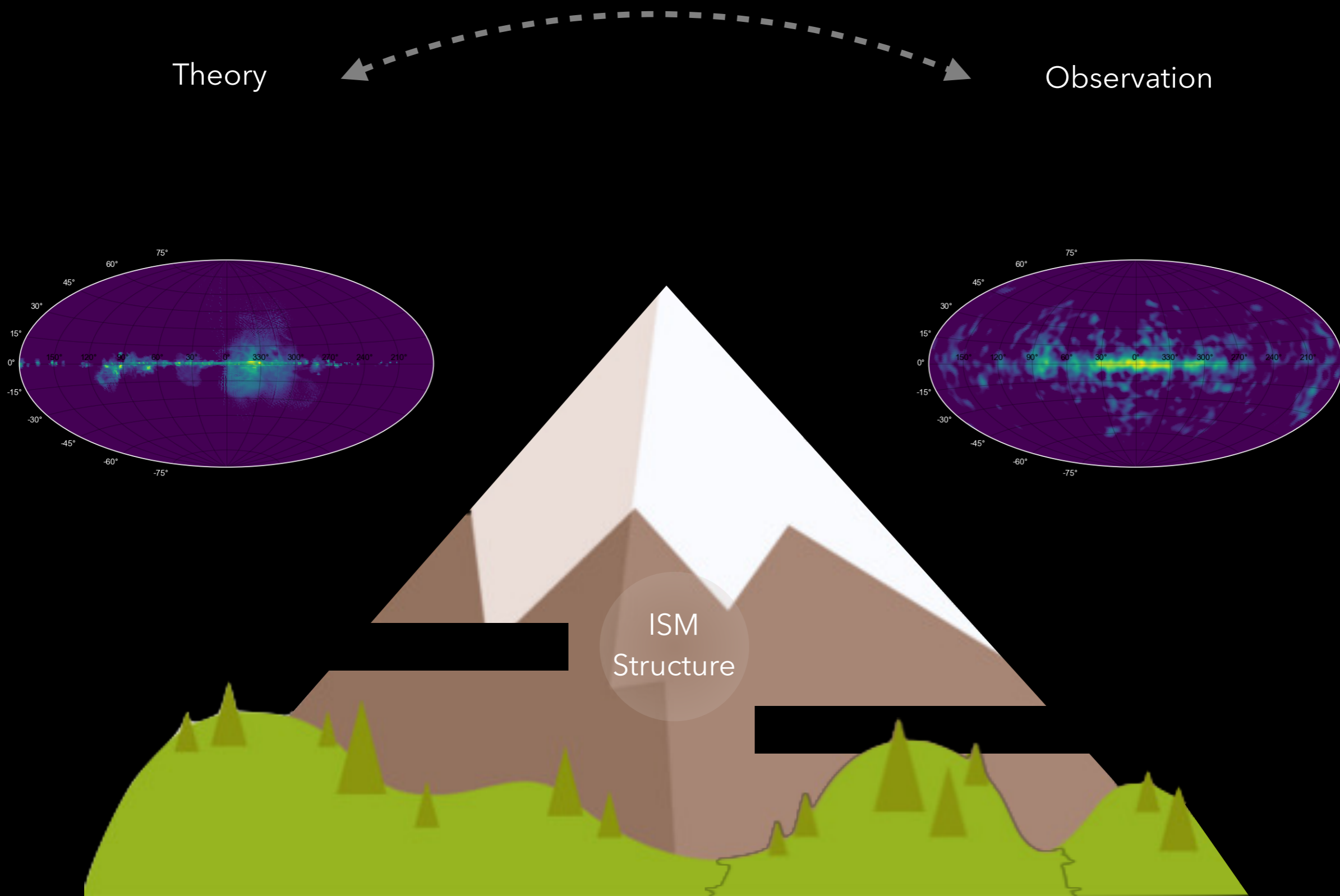
# Comparison of Simulations with Observations



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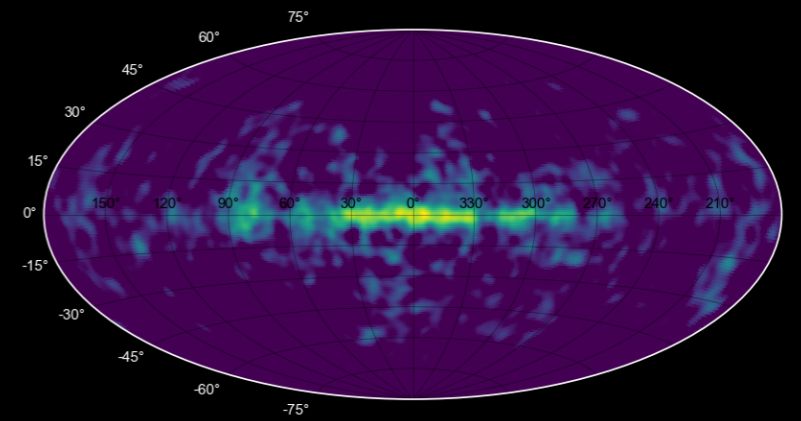
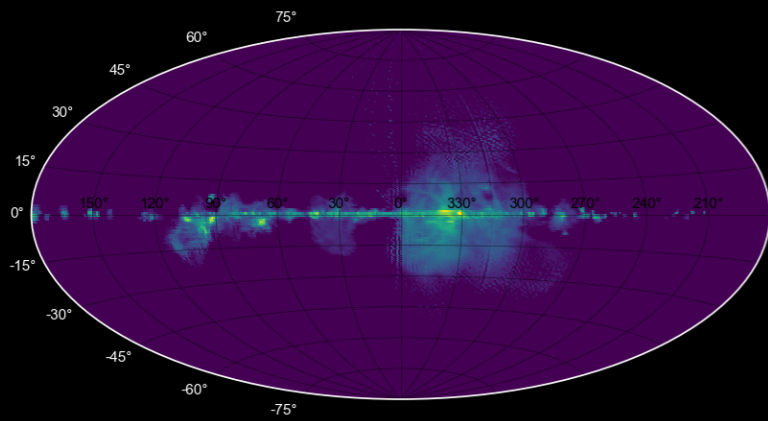
# Comparison of Simulations with Observations



# Our Approach

Theory

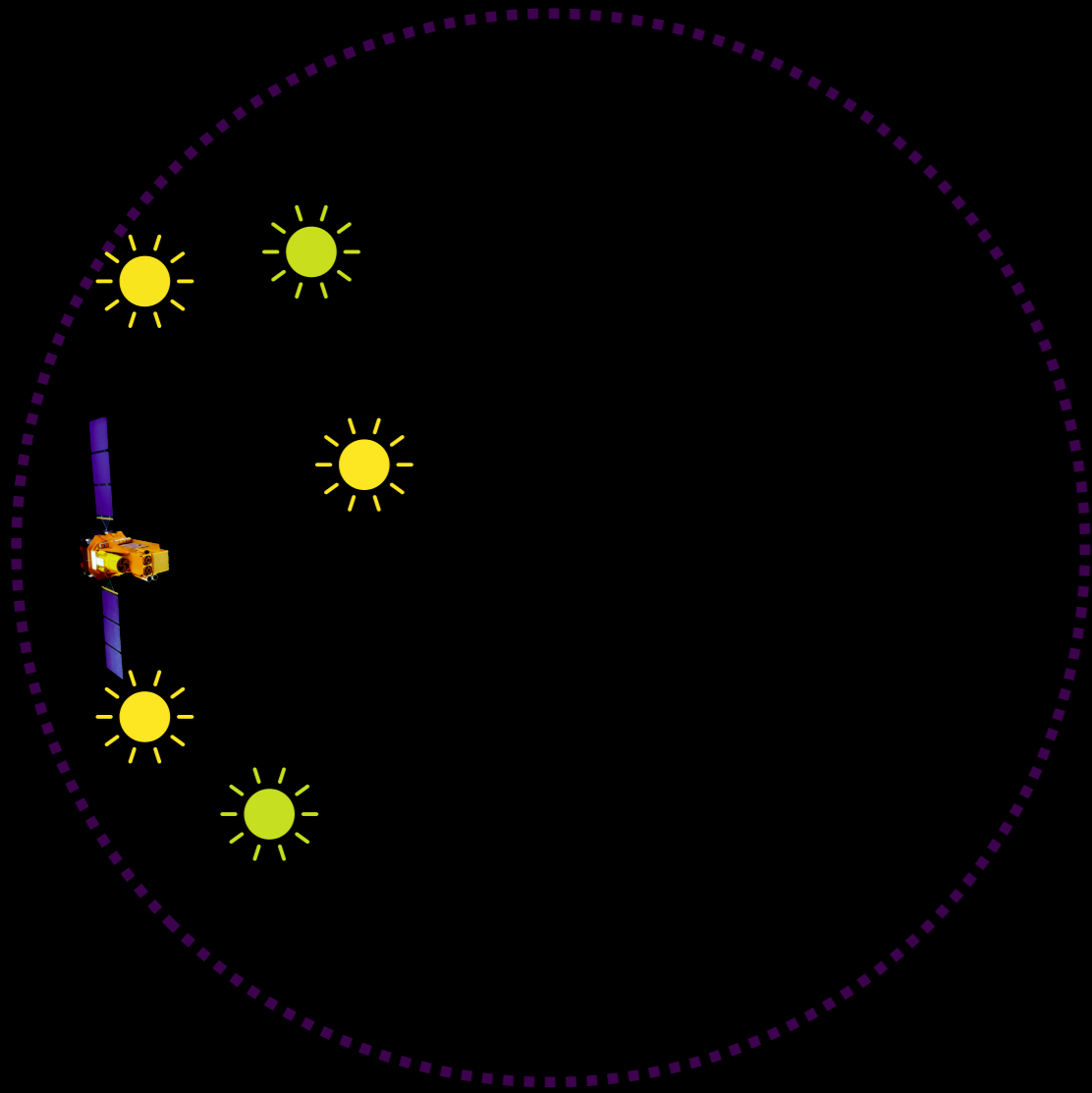
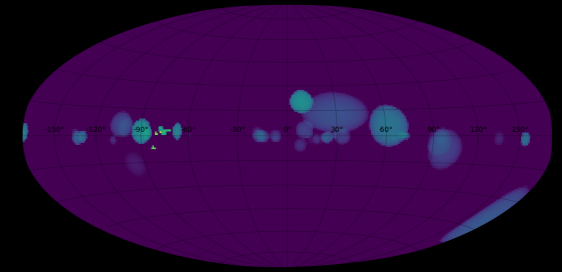
Observation



ISM  
Structure

# Our Approach

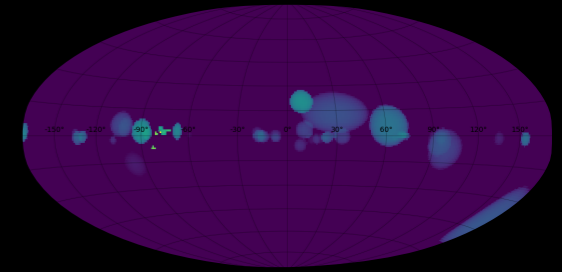
Nearby  
OB Associations



psyco

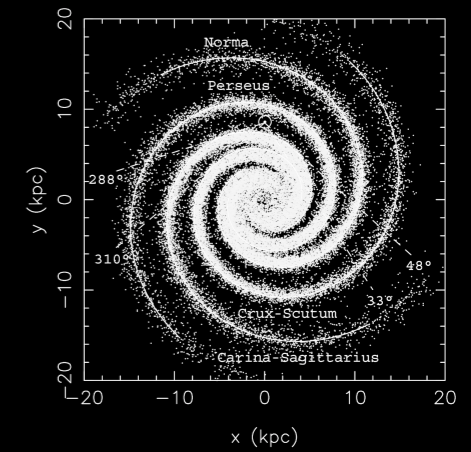
# Our Approach

Nearby  
OB Associations



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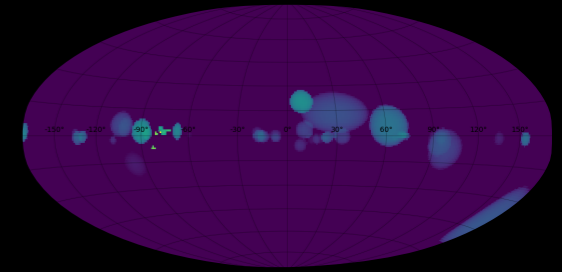
Galaxy Model



psyco

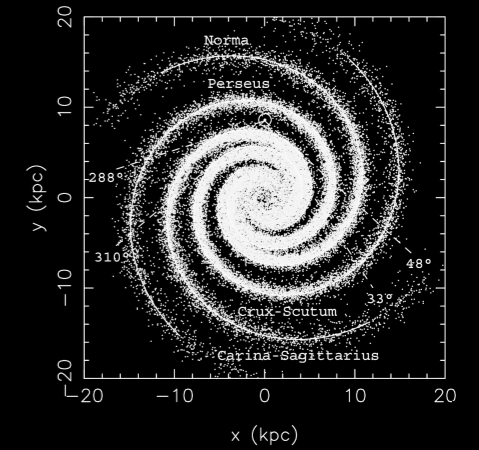
# Our Approach

Nearby  
OB Associations



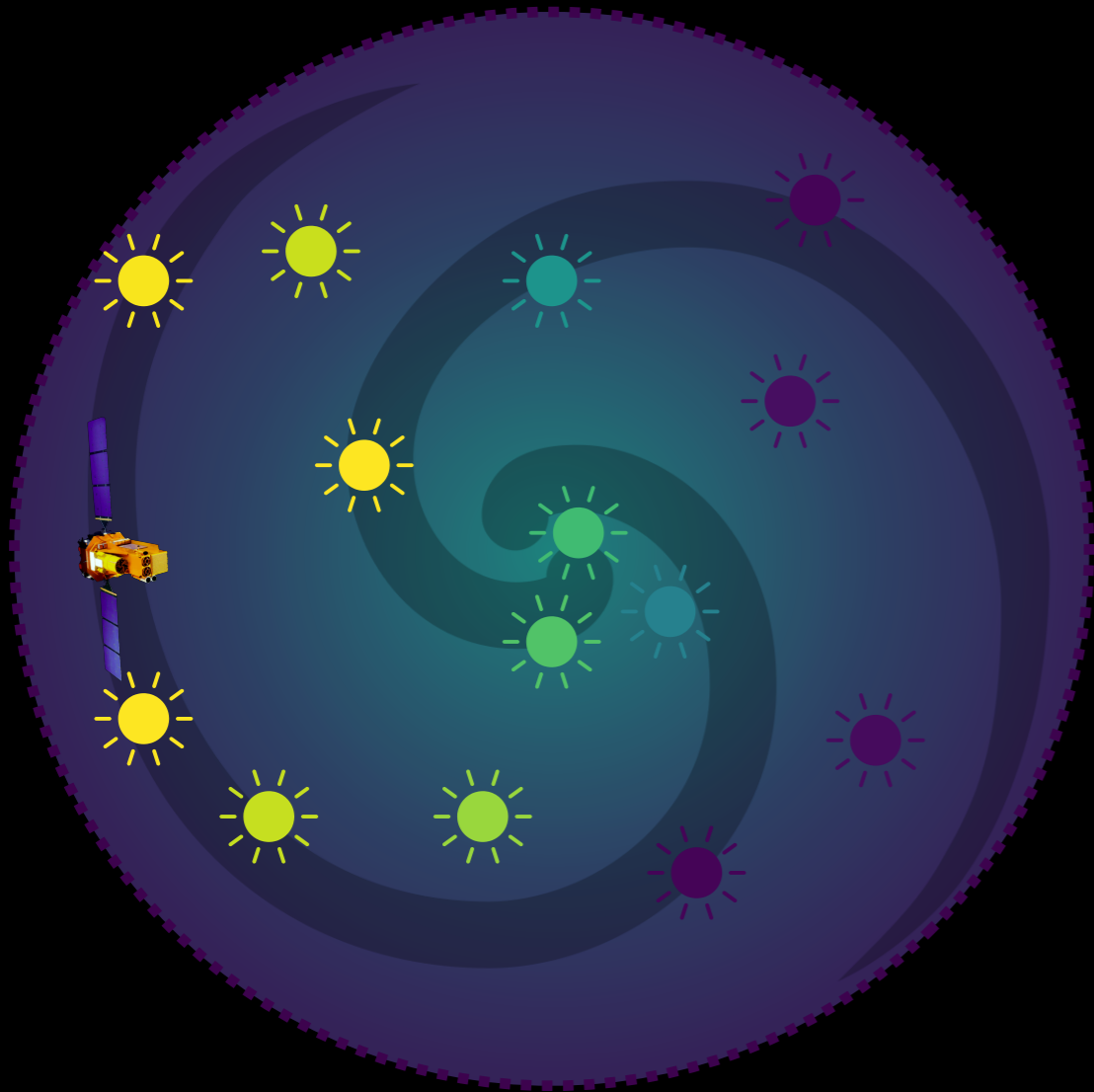
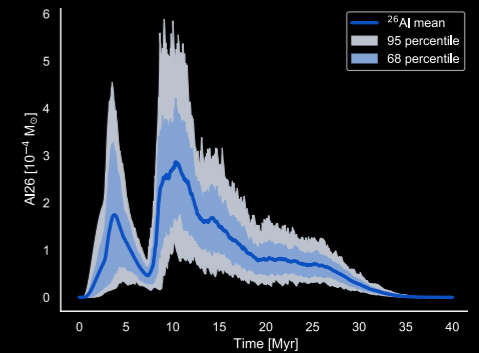
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Galaxy Model



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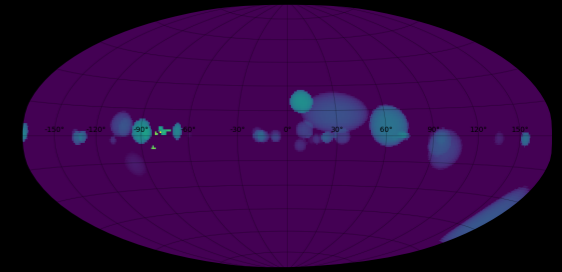
Population Synthesis  
Calculations



psyco

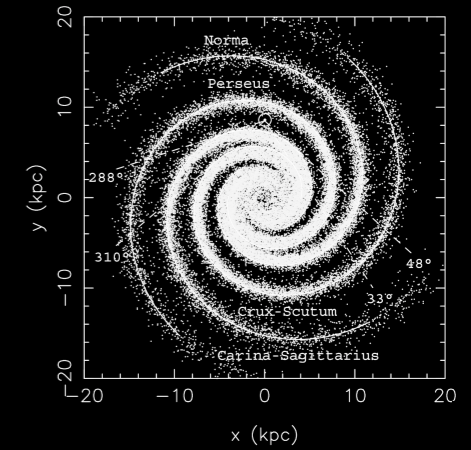
# Our Approach

Nearby  
OB Associations



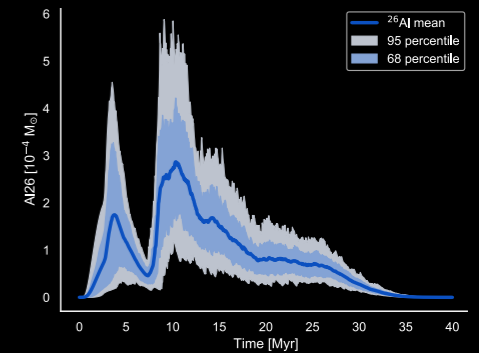
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Galaxy Model

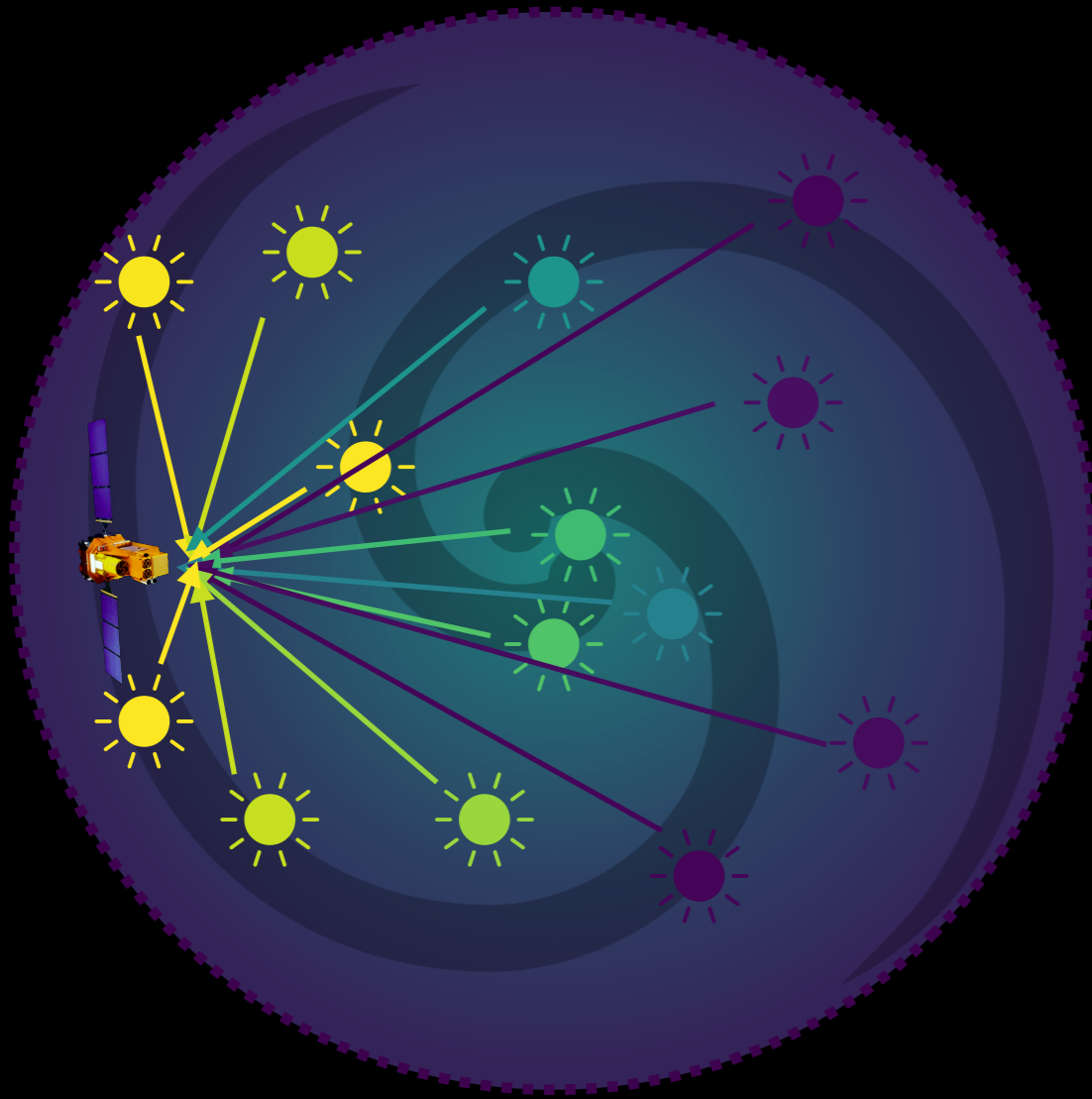
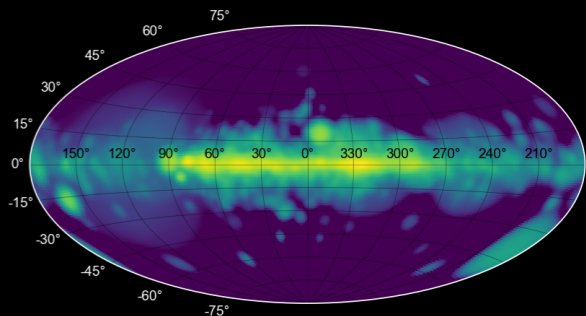


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Population Synthesis  
Calculations



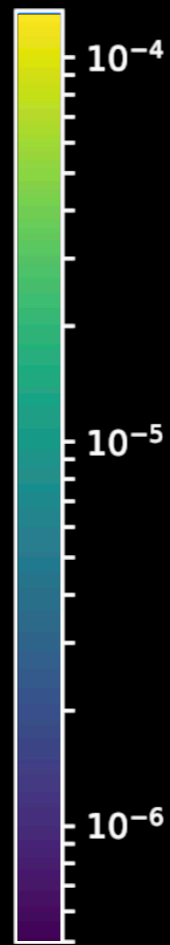
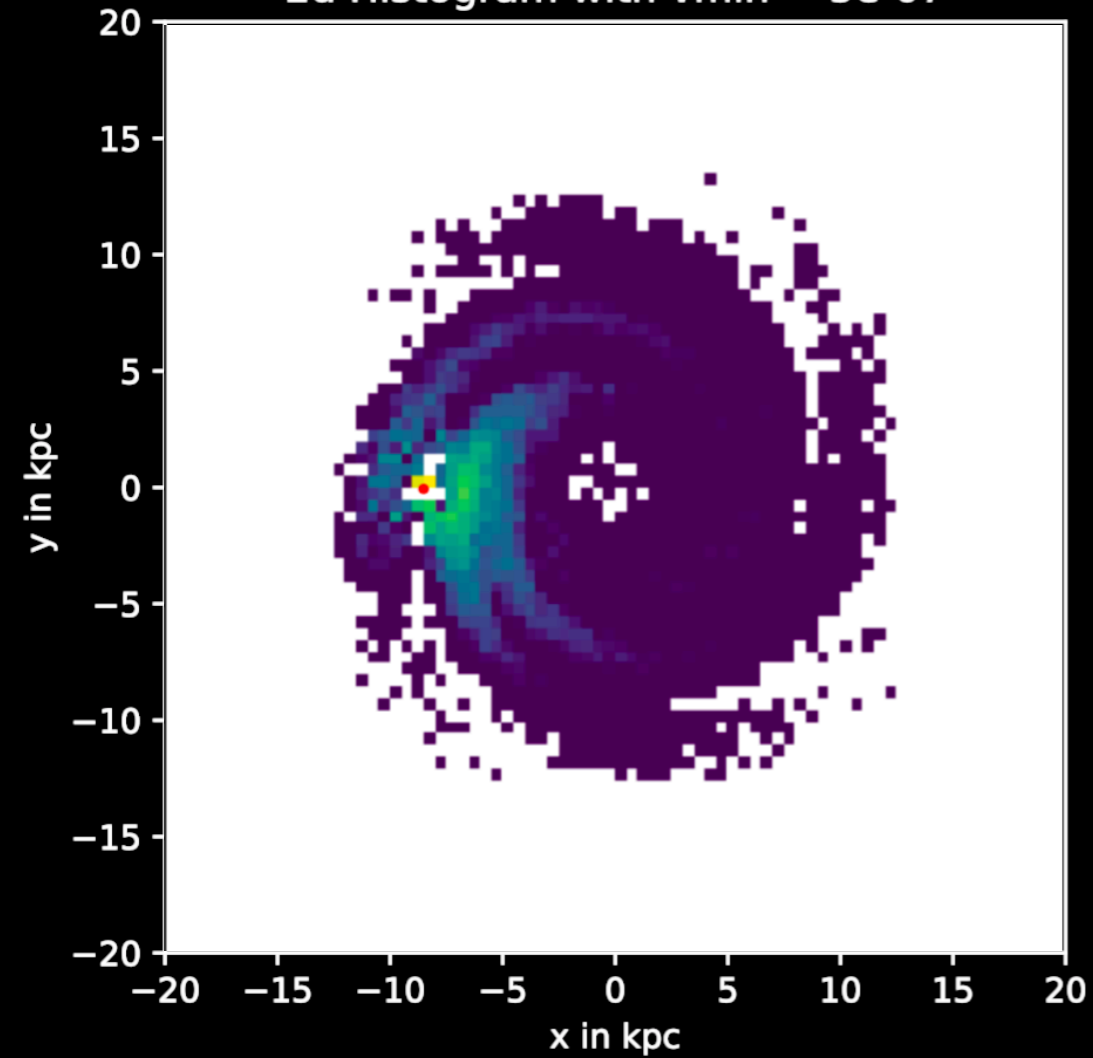
Flux Map



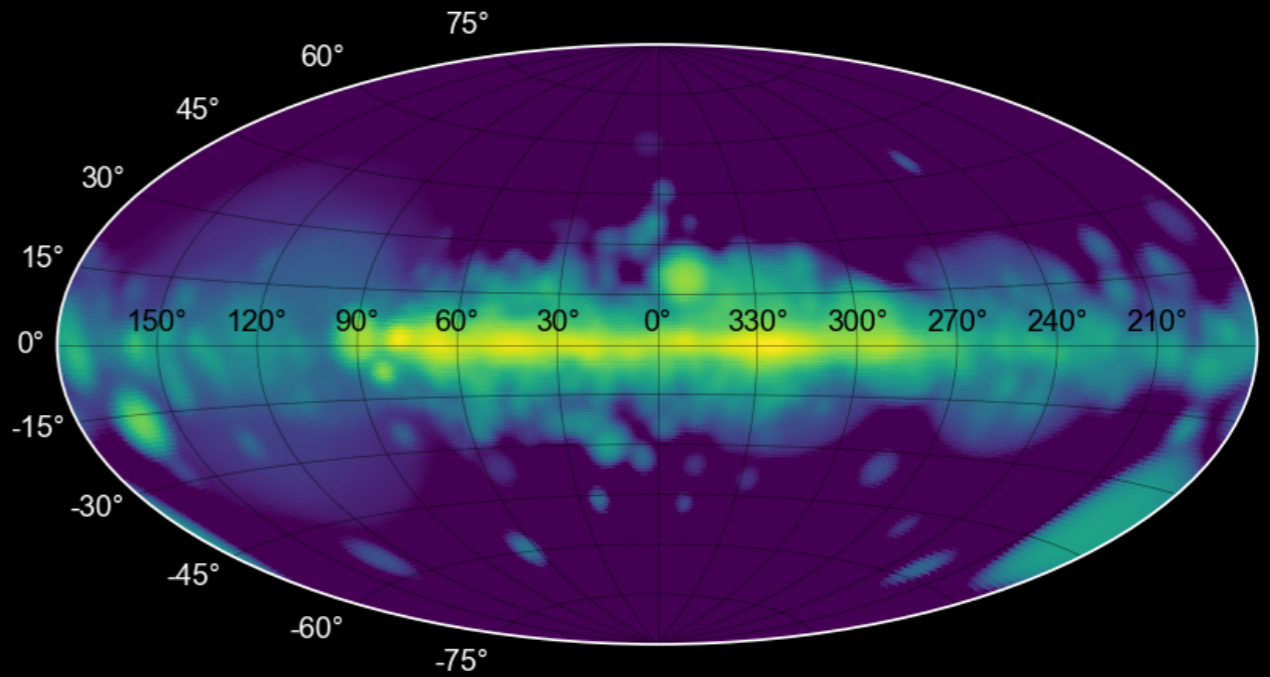
psyco

# Our Approach

2d Histogram with  $v_{\min} = 5e-07$

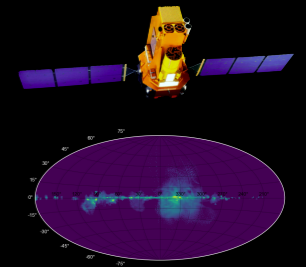
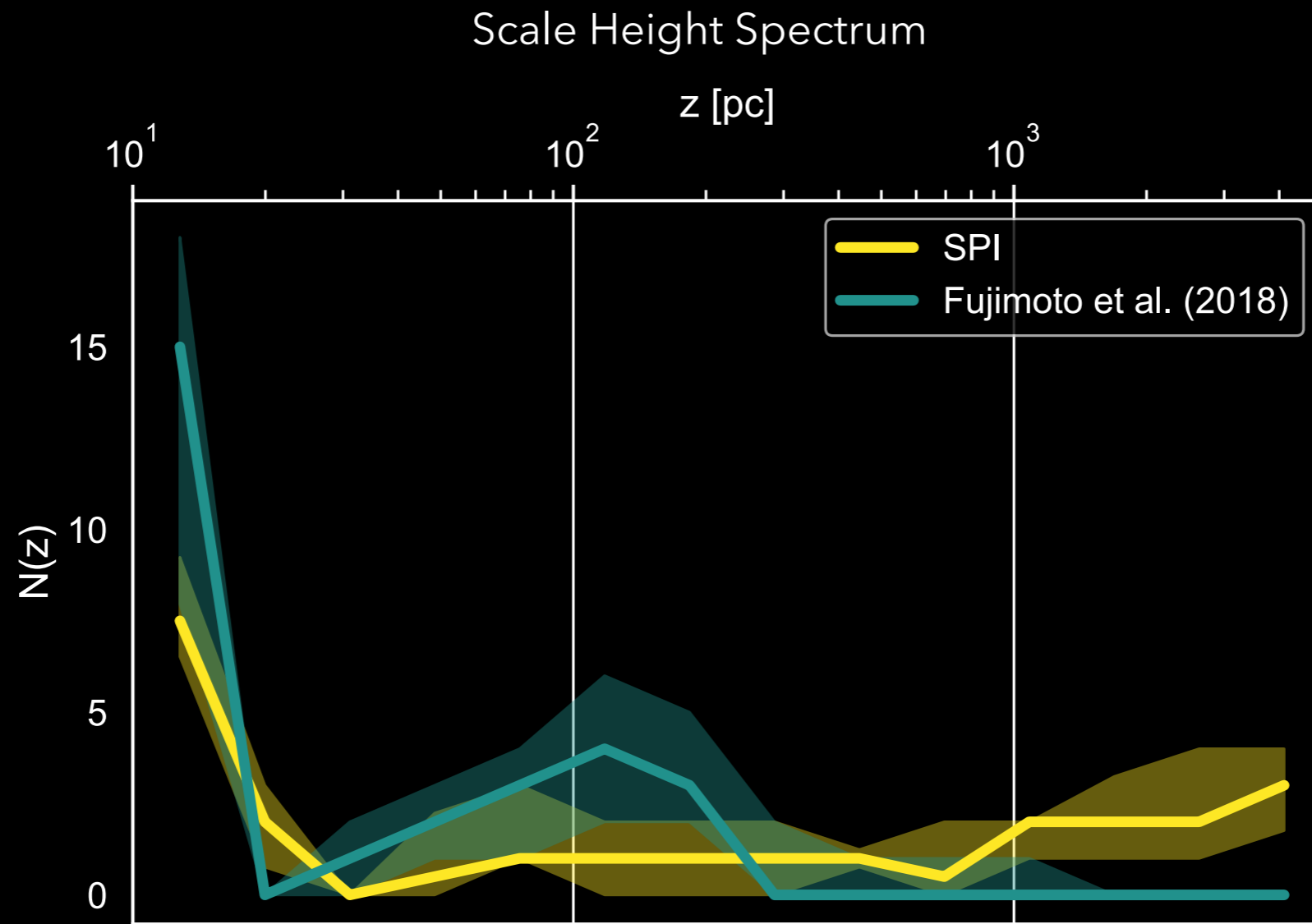


Flux [ $\text{ph cm}^{-2} \text{s}^{-1}$ ]

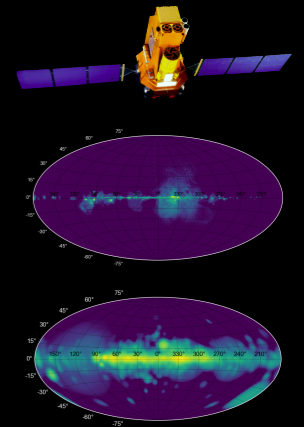
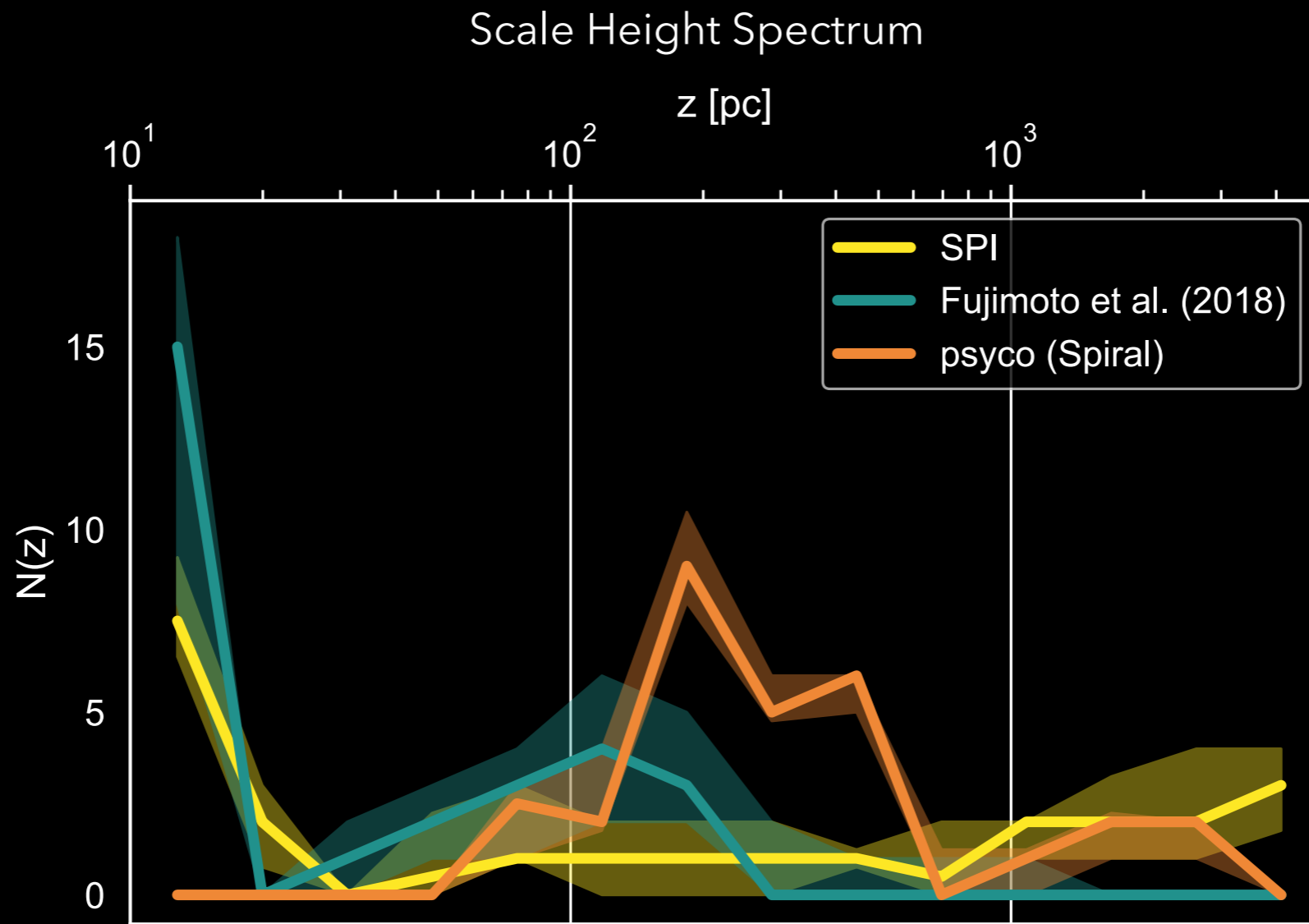


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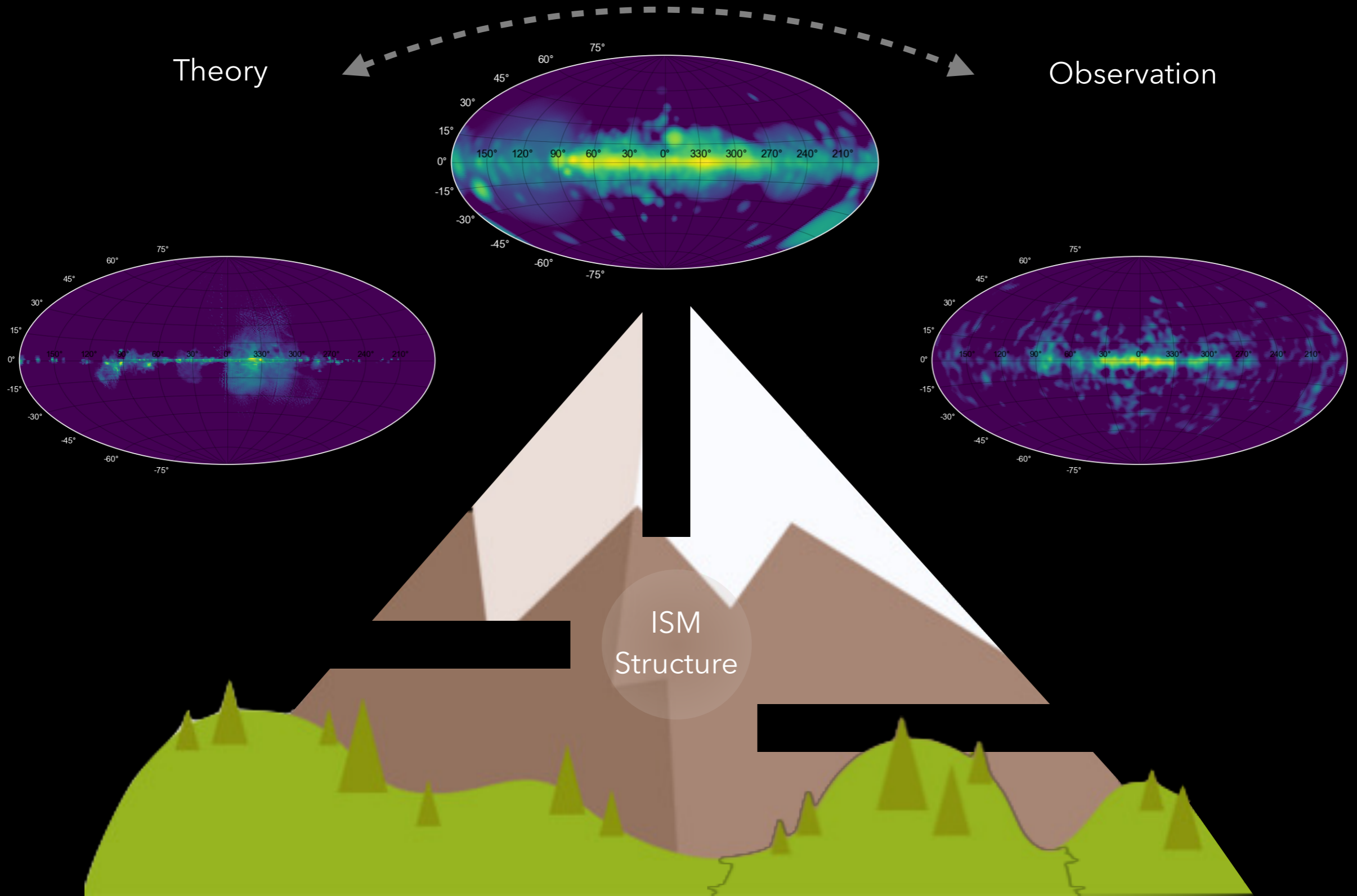
# Our Approach



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# Summary



# Summary

