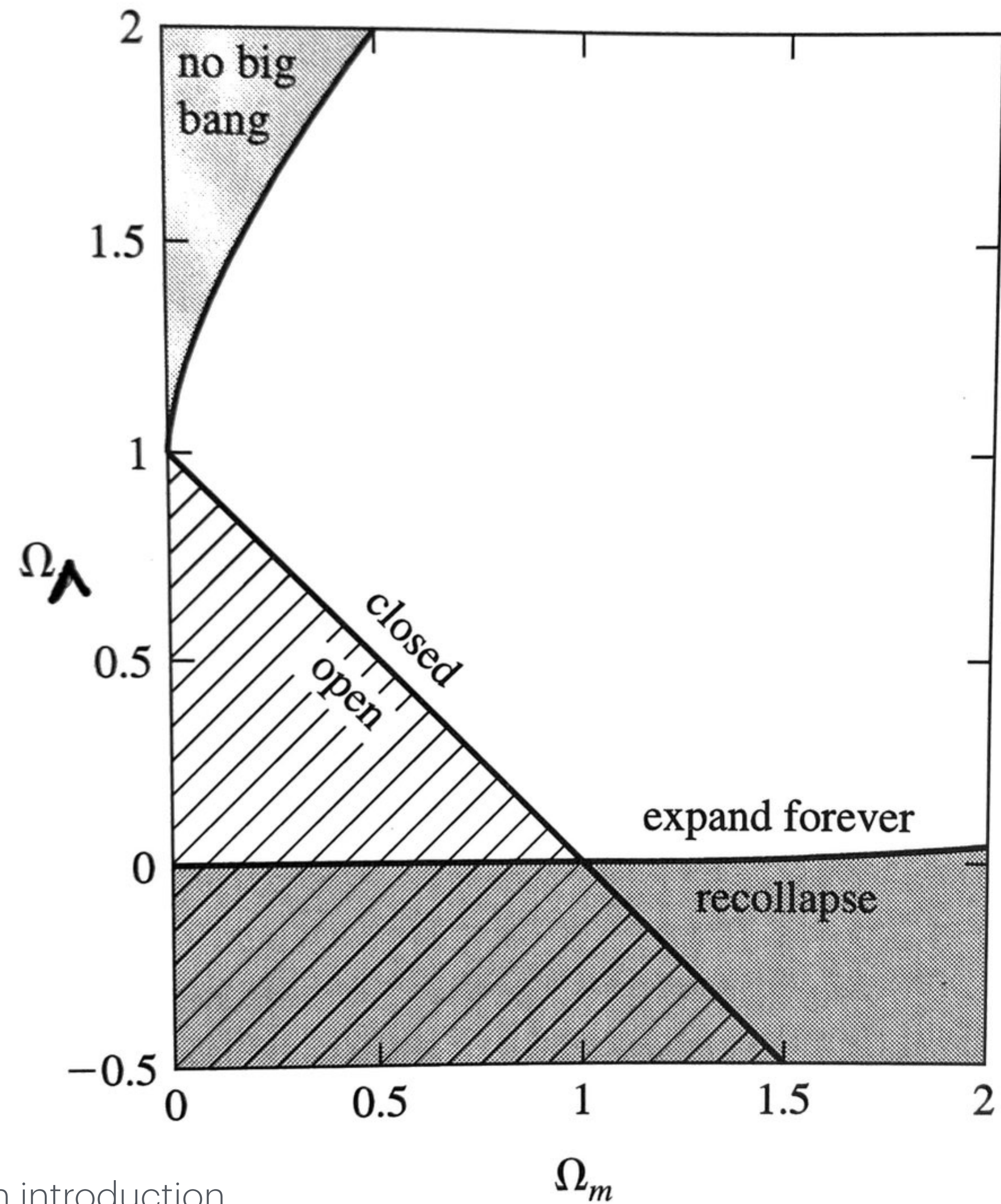
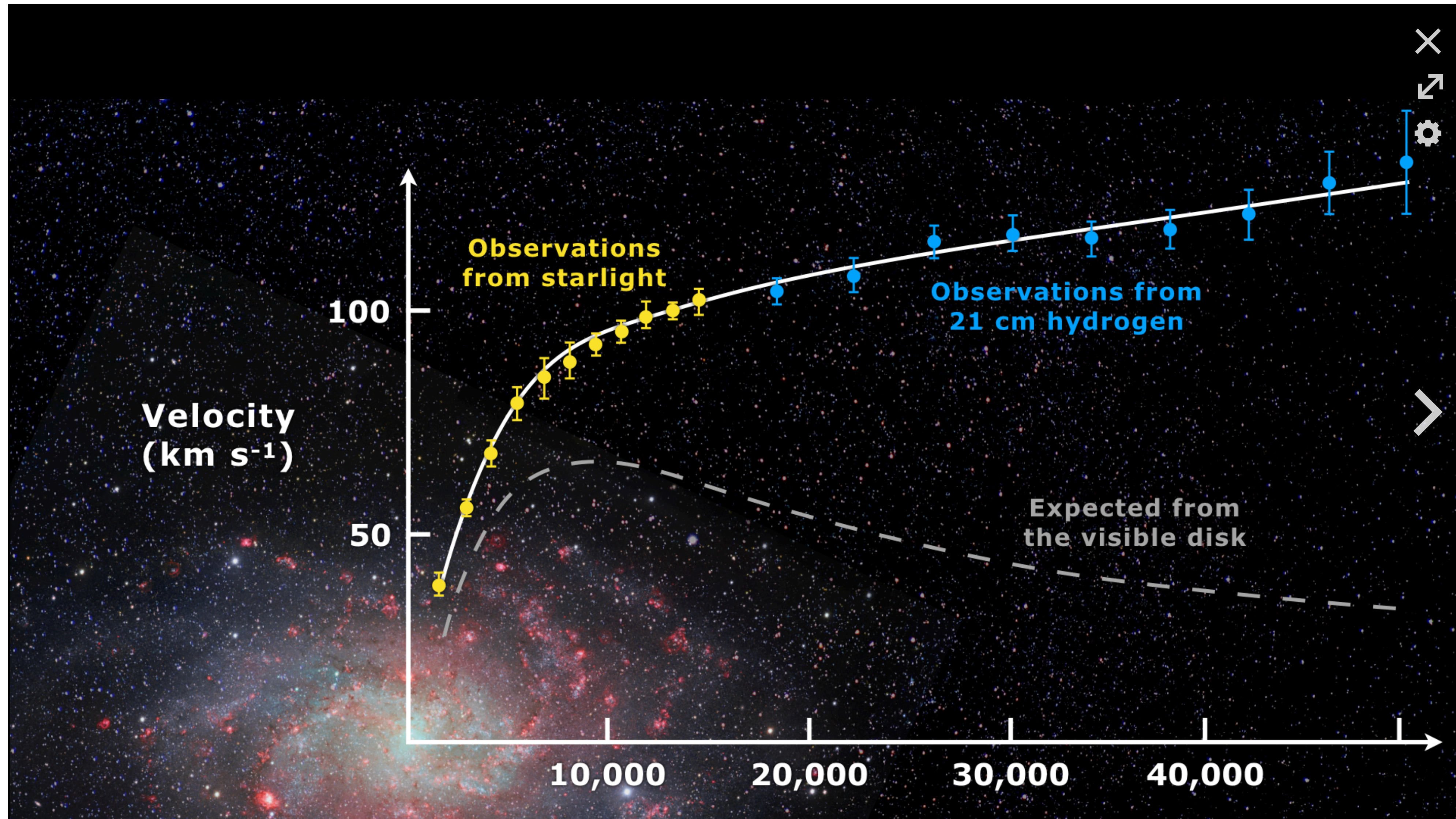


Classes of models based on Ω_Λ and Ω_m



Vera Rubin and Galaxy Rotation Curves - Dark Matter




Rotation curve of spiral galaxy Messier 33 (yellow and blue points with error bars), and a predicted one from distribution of the visible matter (gray line). The discrepancy between the two curves can be accounted for by adding a dark matter halo surrounding the galaxy.

 [More details](#)

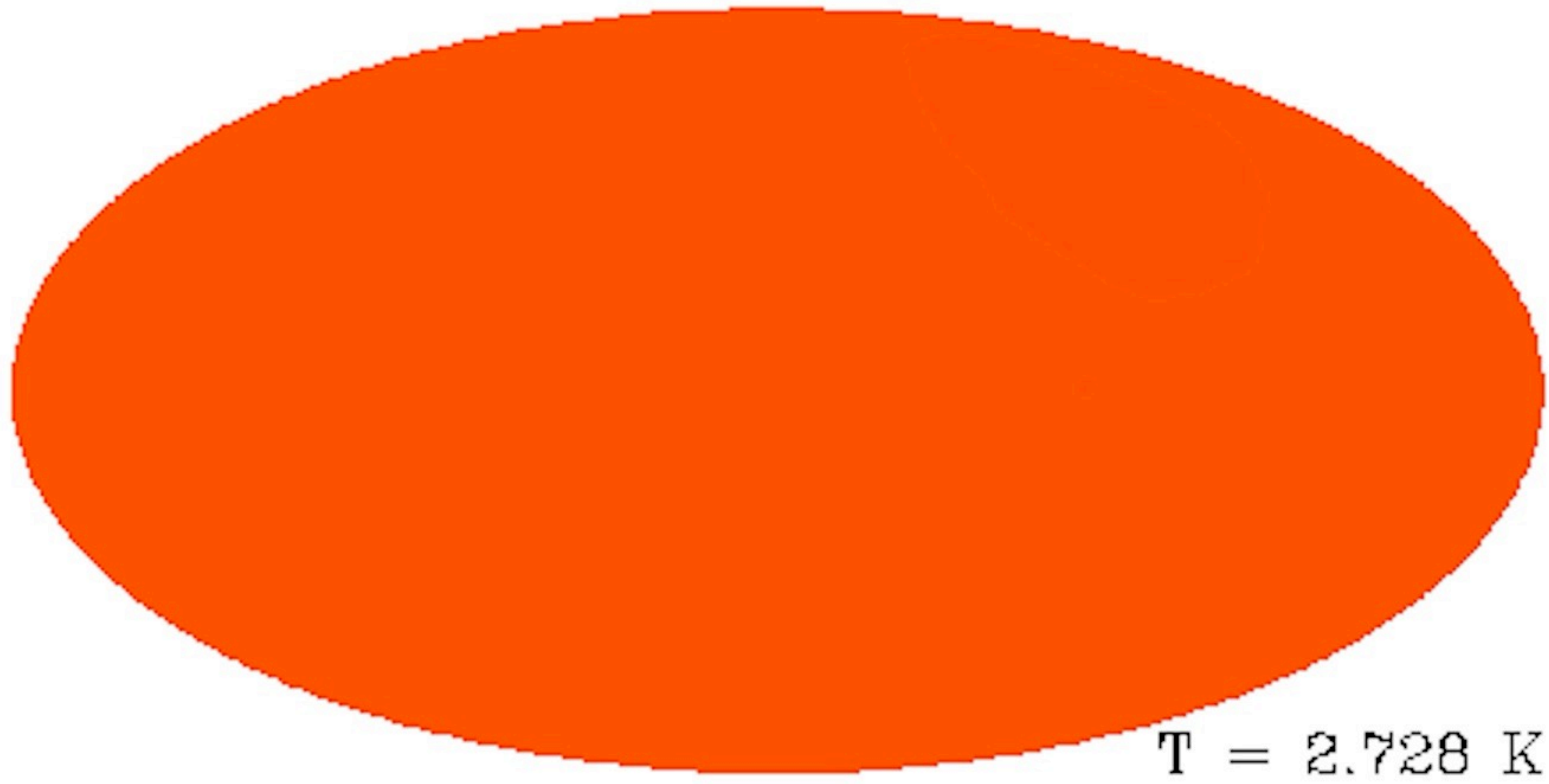
 [Mario De Leo](#) - Own work

 [CC BY-SA 4.0](#)

Rotation curve of spiral galaxy Messier 33 (yellow and blue points with error bars), and a predicted one from distribution of the visible matter (gray line). The discrepancy between the two curves can be accounted for by adding a dark matter halo surrounding the galaxy.

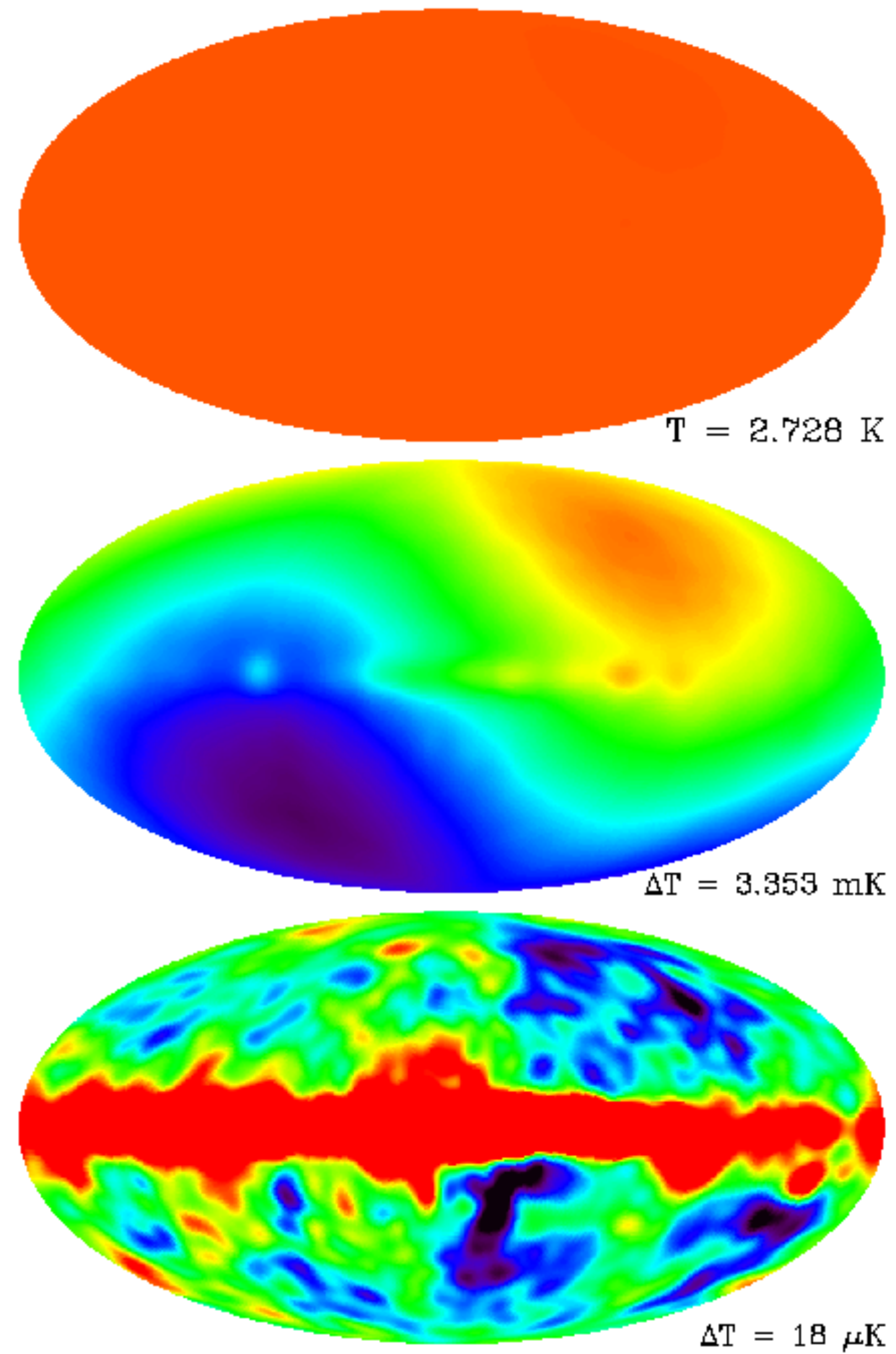
 File: Rotation curve of spiral galaxy Messier 33 (Triangulum).png

COBE CMB Observations

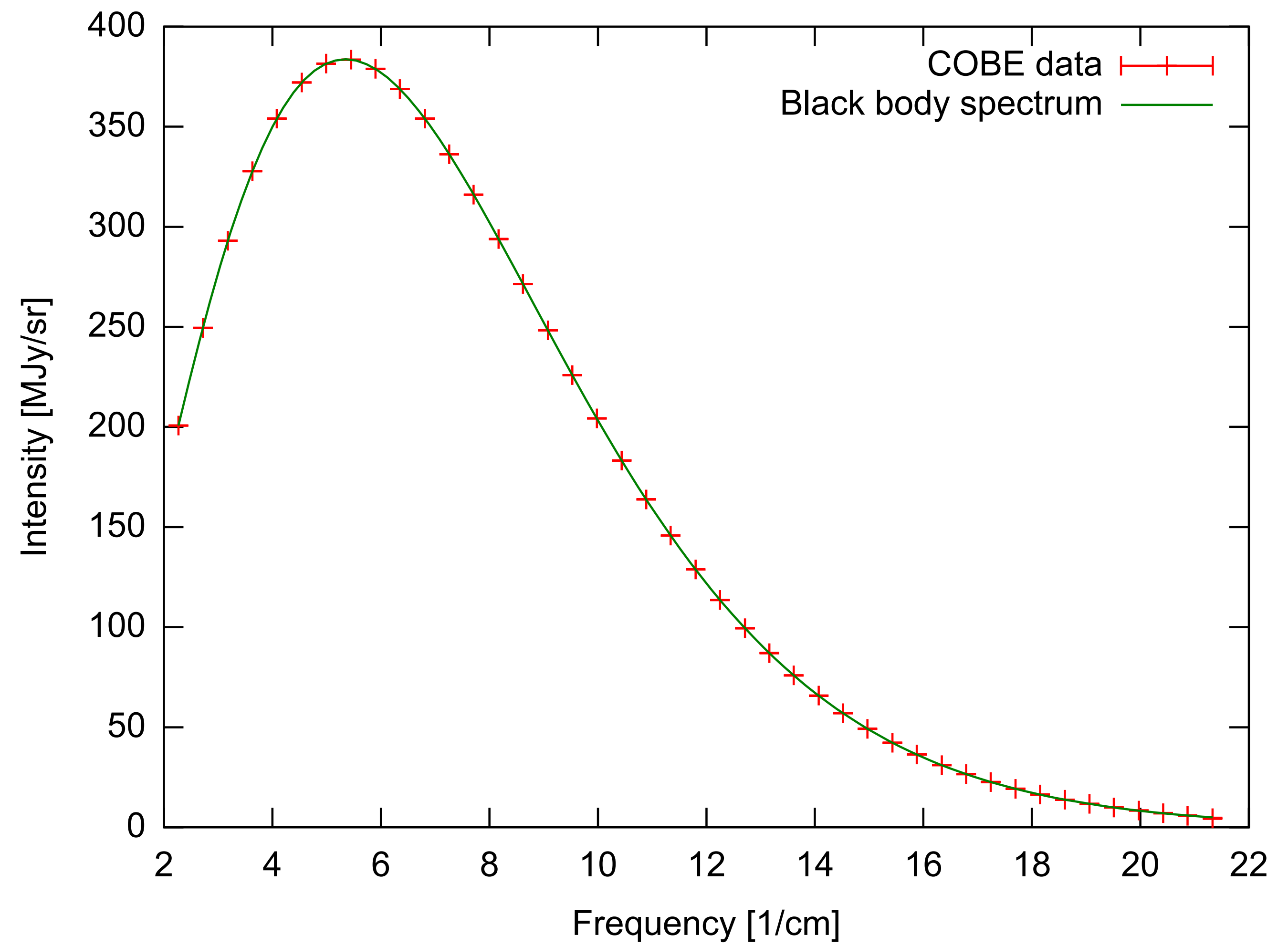


T = 2.728 K

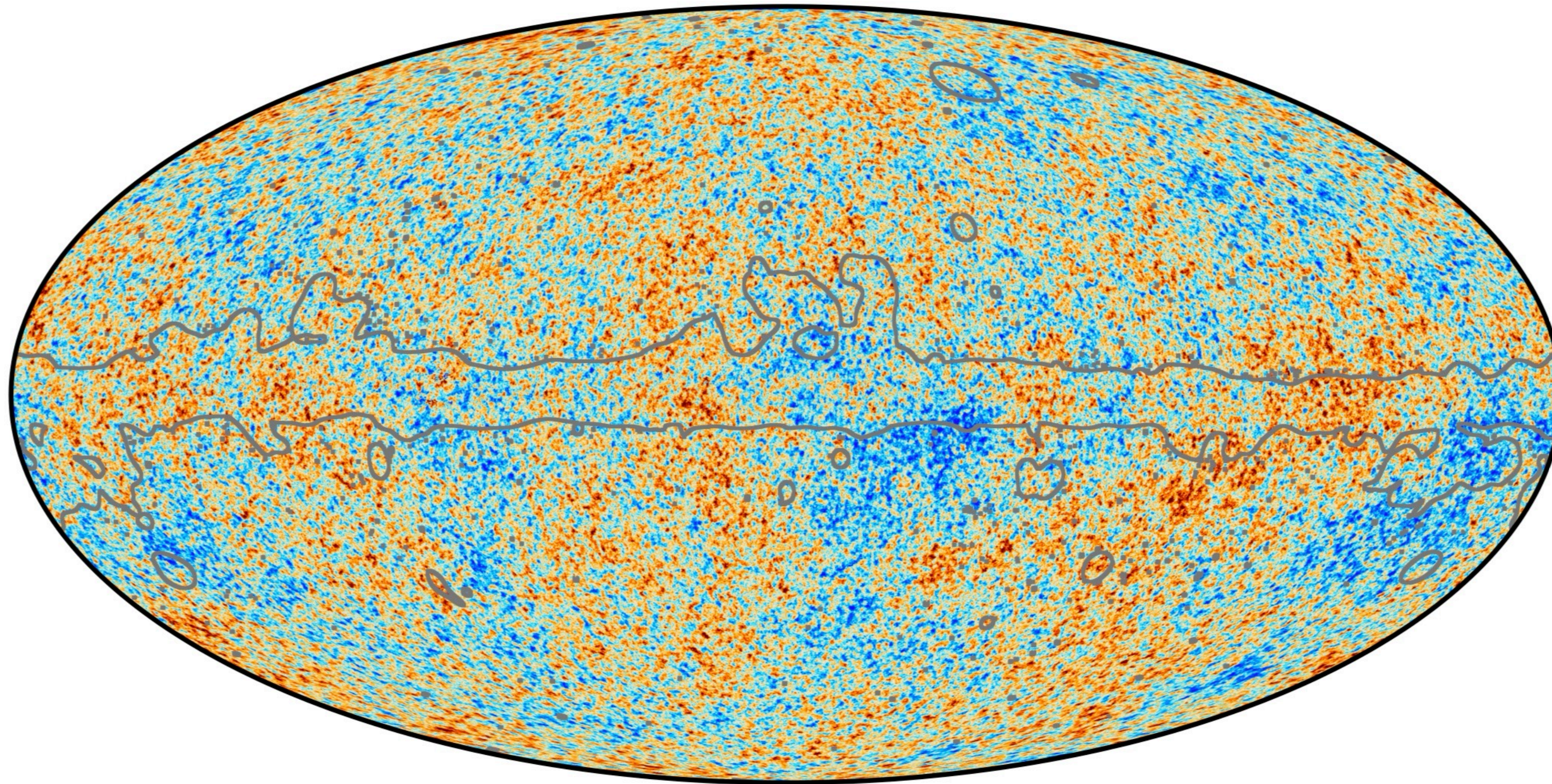
COBE CMB Observations



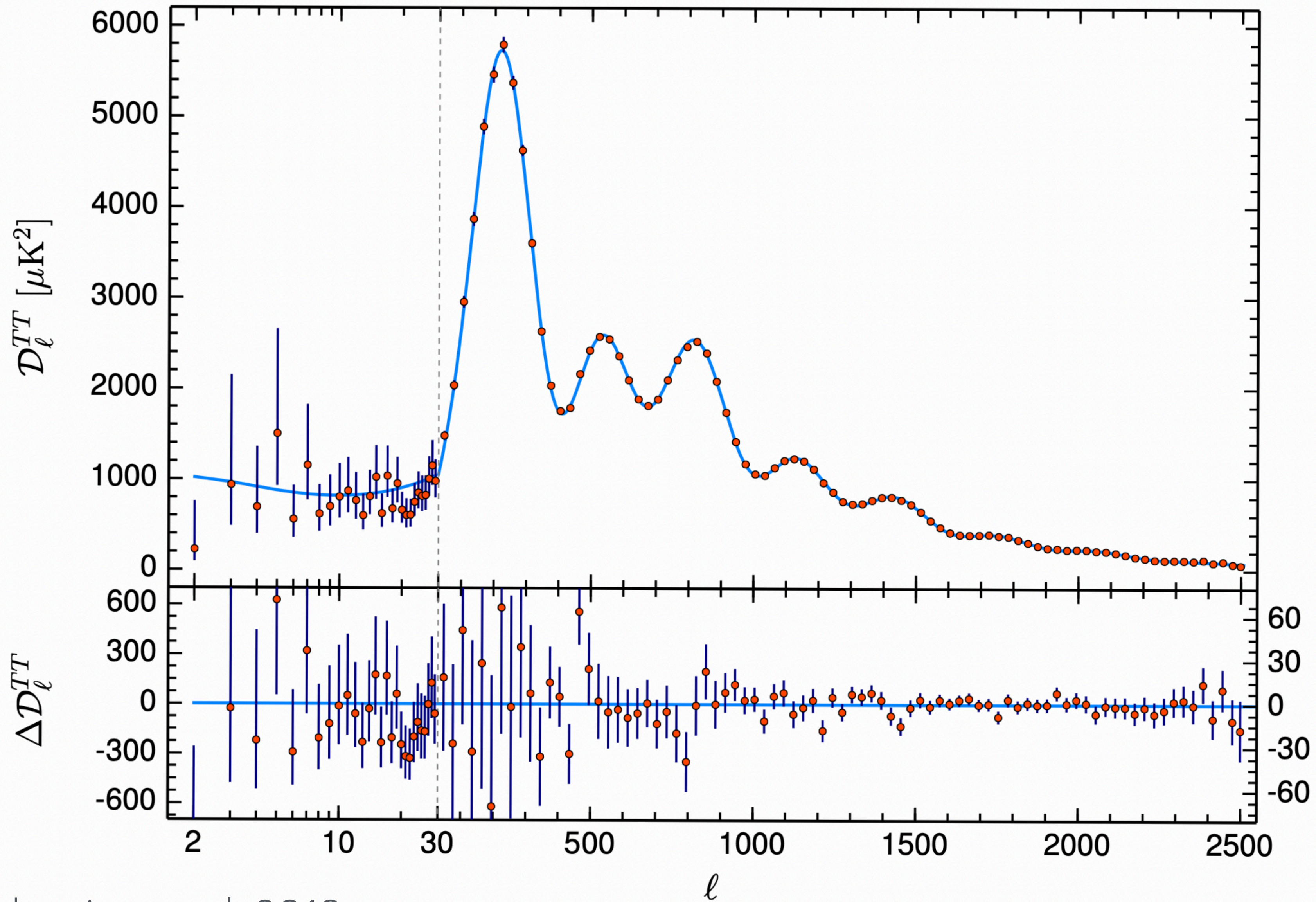
Cosmic microwave background spectrum (from COBE)



PLANCK CMB Observations



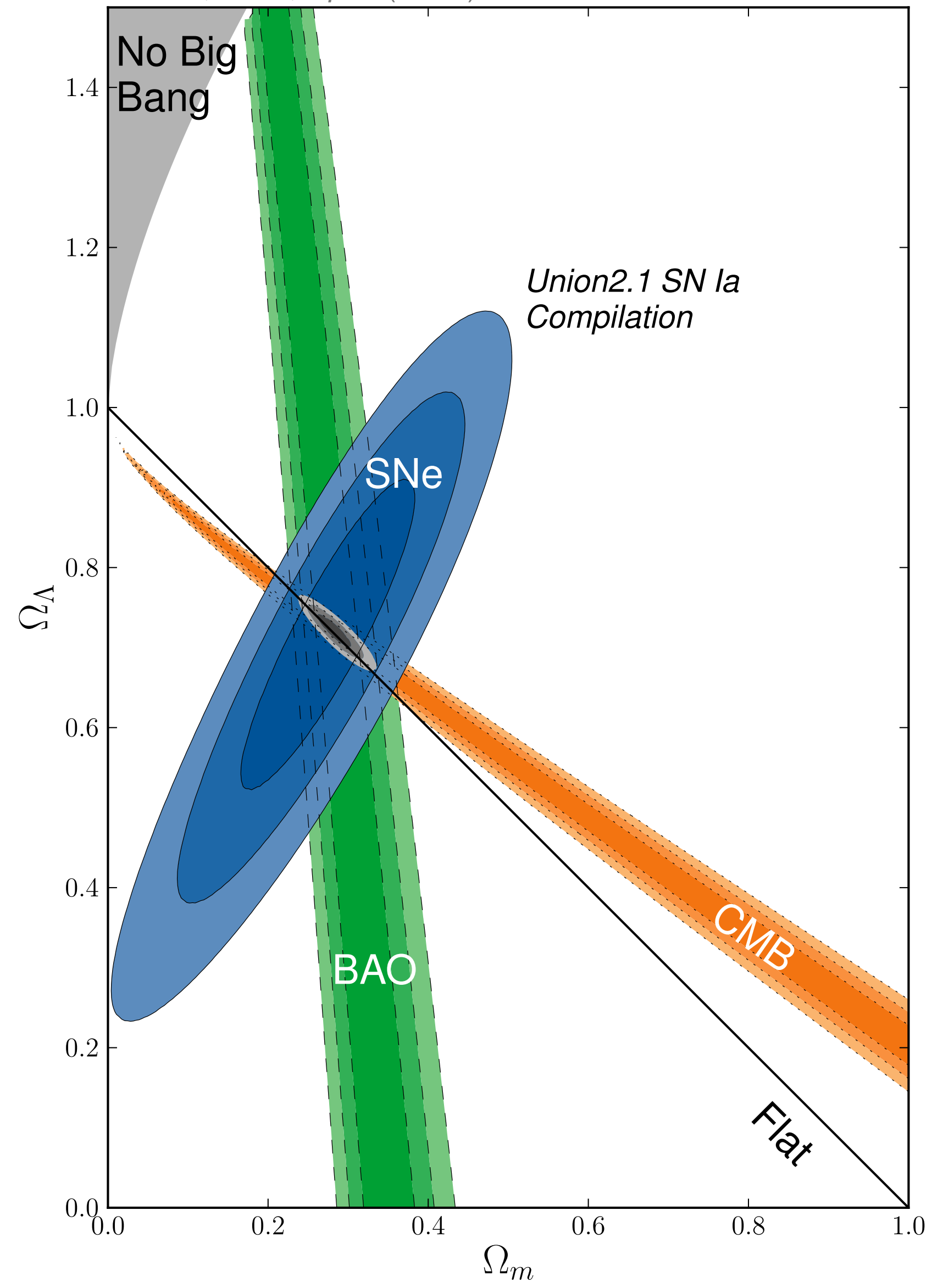
PLANCK CMB Observations



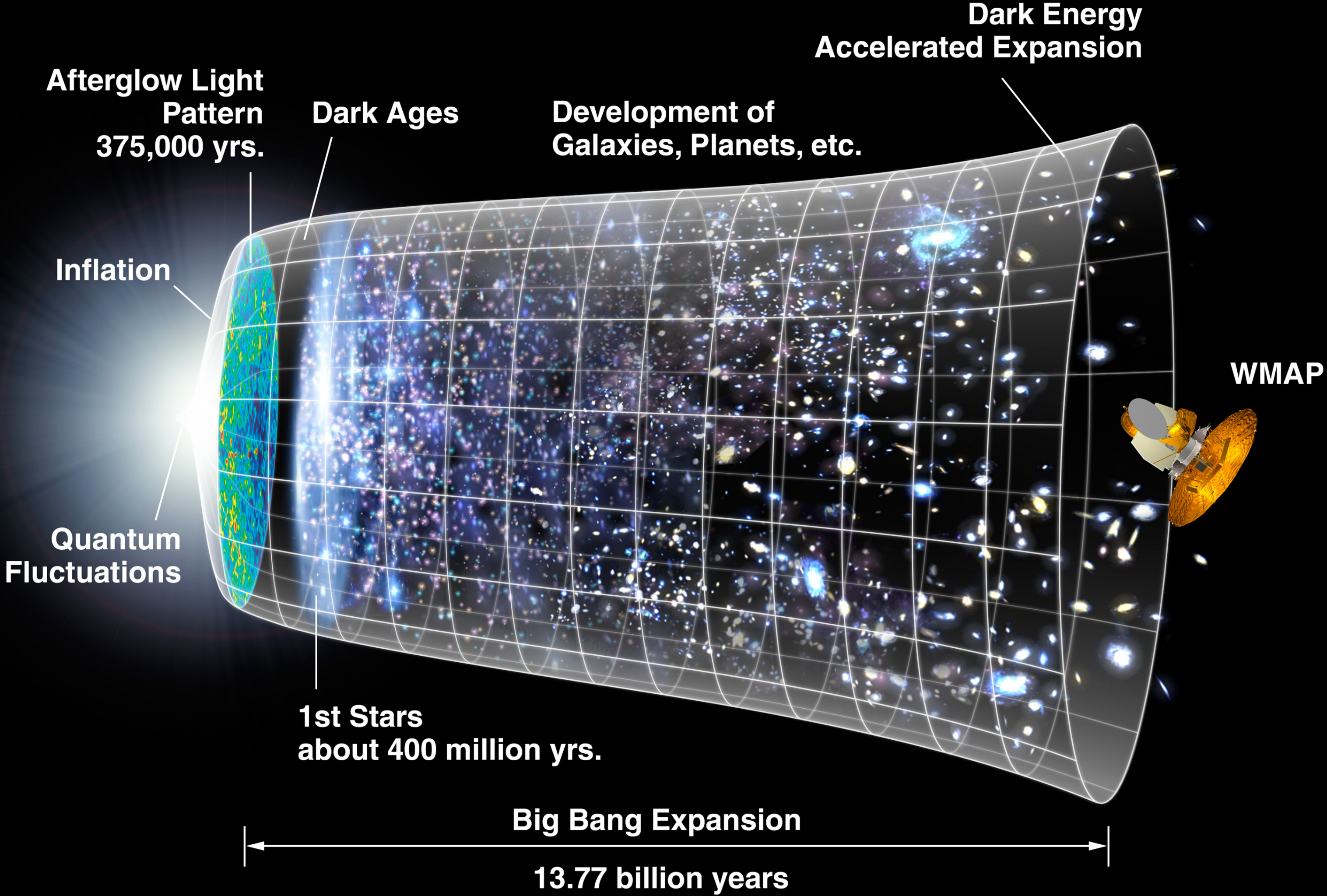
Aghanim et. al. 2019

Data for models for Ω_Λ and Ω_m

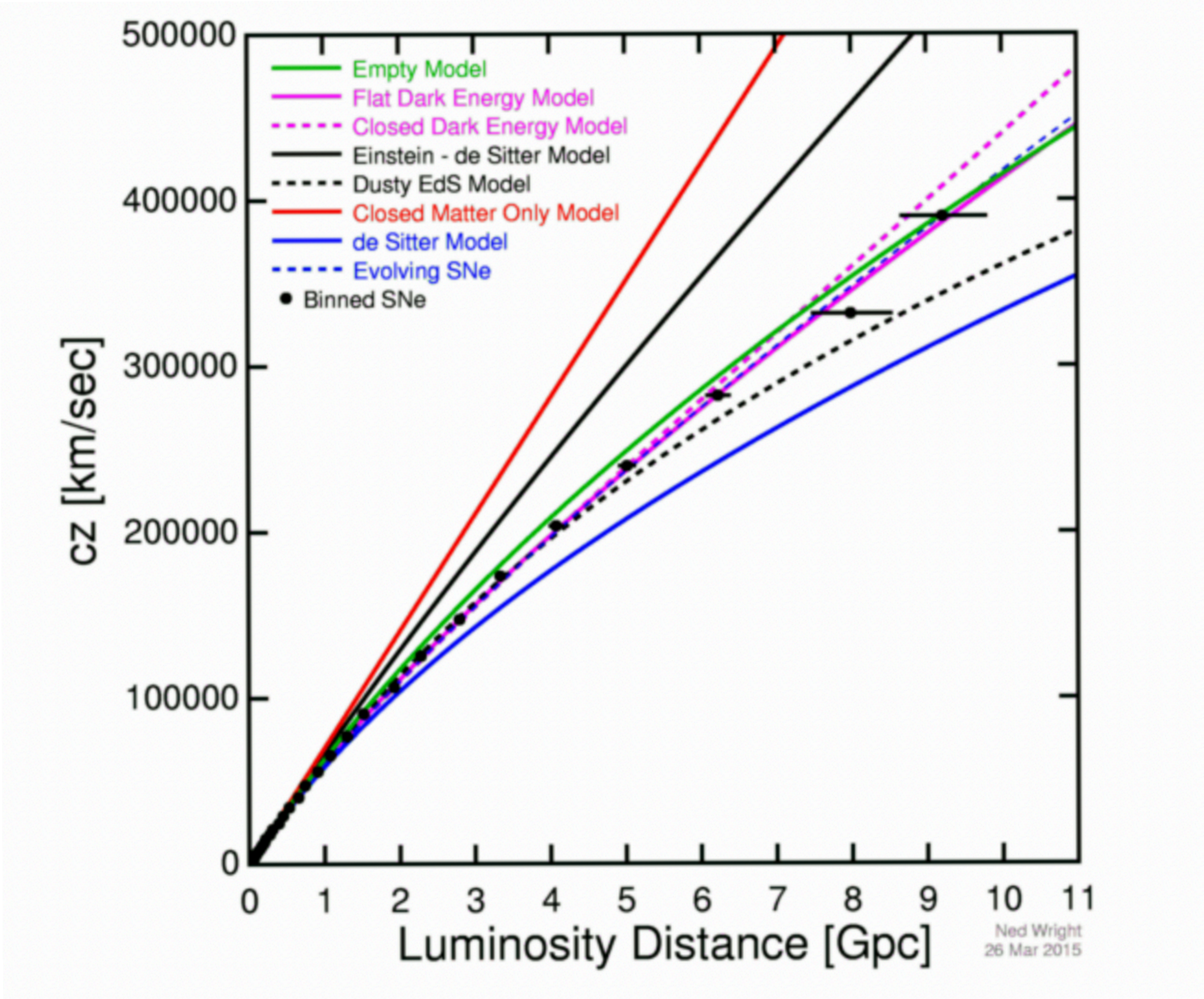
Supernova Cosmology Project
Suzuki, et al., *Ap.J.* (2011)



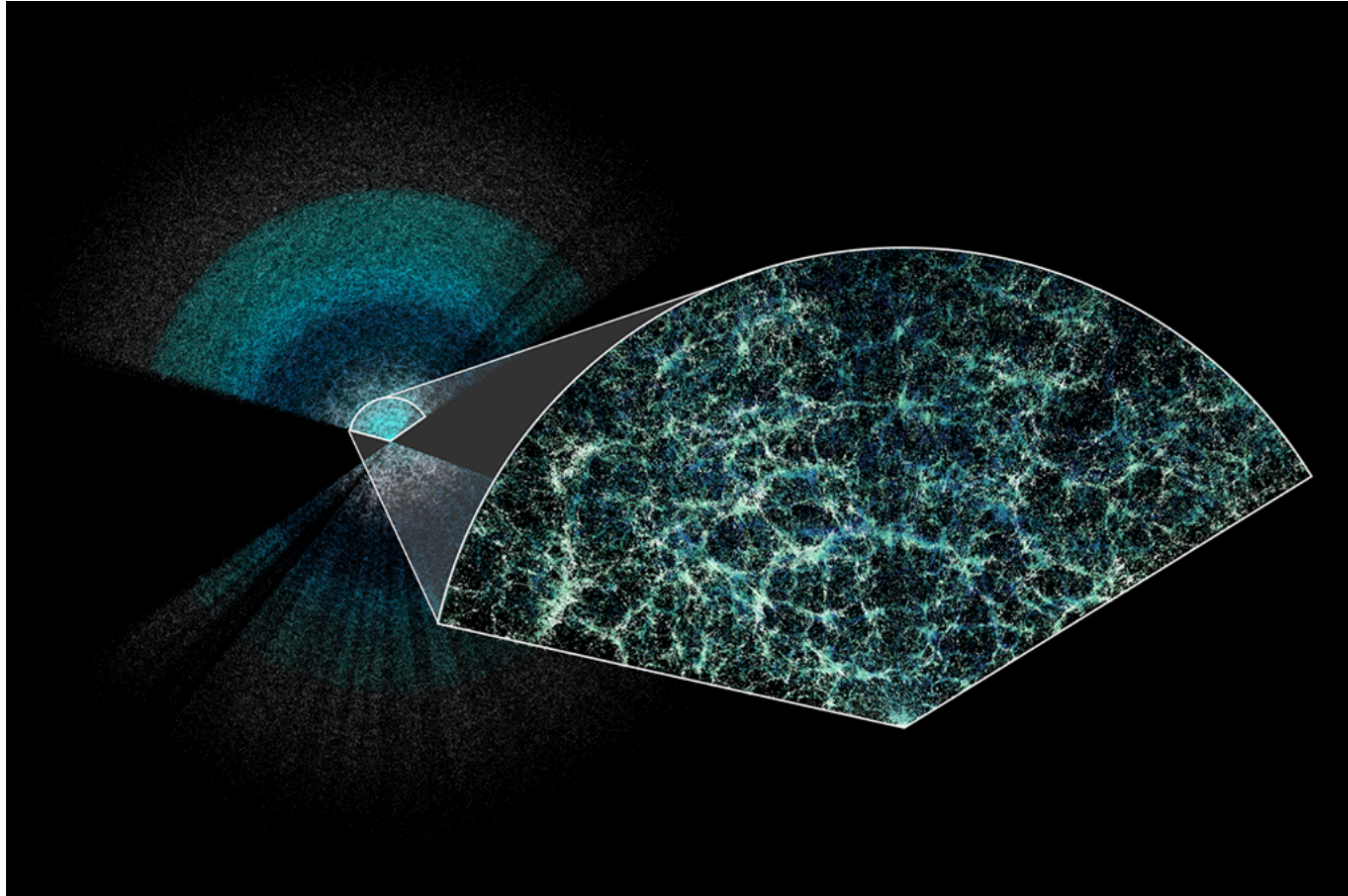
Cosmological history as observed in the CMB (from WMAP)



Models with binned supernovae data



DESI sky survey data



DESI has made the largest 3D map of our universe to date. Earth is at the center of this thin slice of the full map. In the magnified section, it is easy to see the underlying structure of matter in our universe. Claire Lamman/DESI collaboration; custom colormap package by cmastro