Отображение вселенный 우주를 지도로 나타내기

Mapping the Universe

Cartographie de l'univers

Nuevos Mapas del Universo

Lập bản đồ vũ trụ

새벽녘에서 지금에, 瞭解宇宙

Professor George F. Smoot

Berkeley Center for Cosmological Physics

LBNL & Physics Department University of California at Berkeley

Chaires Blaise Pascal --- Paris Center for Cosmological Physics (PCCP)

Université Sorbonne Paris Cité - Université Paris Diderot - APC

Extreme Universe Laboratory Lomonosov Moscow State University

Cosmology and Astrophysics Research Center (CARC) TNU China

Blois, France 25th Anniversary *May 2014*

"Cosmic Scene Investigation" Investigación de la escena cósmica

宇宙場面調査 Место действия - Космос

The Dawning of the Universe

El amanecer del Universo

L'Aube de l'Univers 破曉宇宙, 우주의 날이 새기

Relics of Creation

Reliquias de la Creación

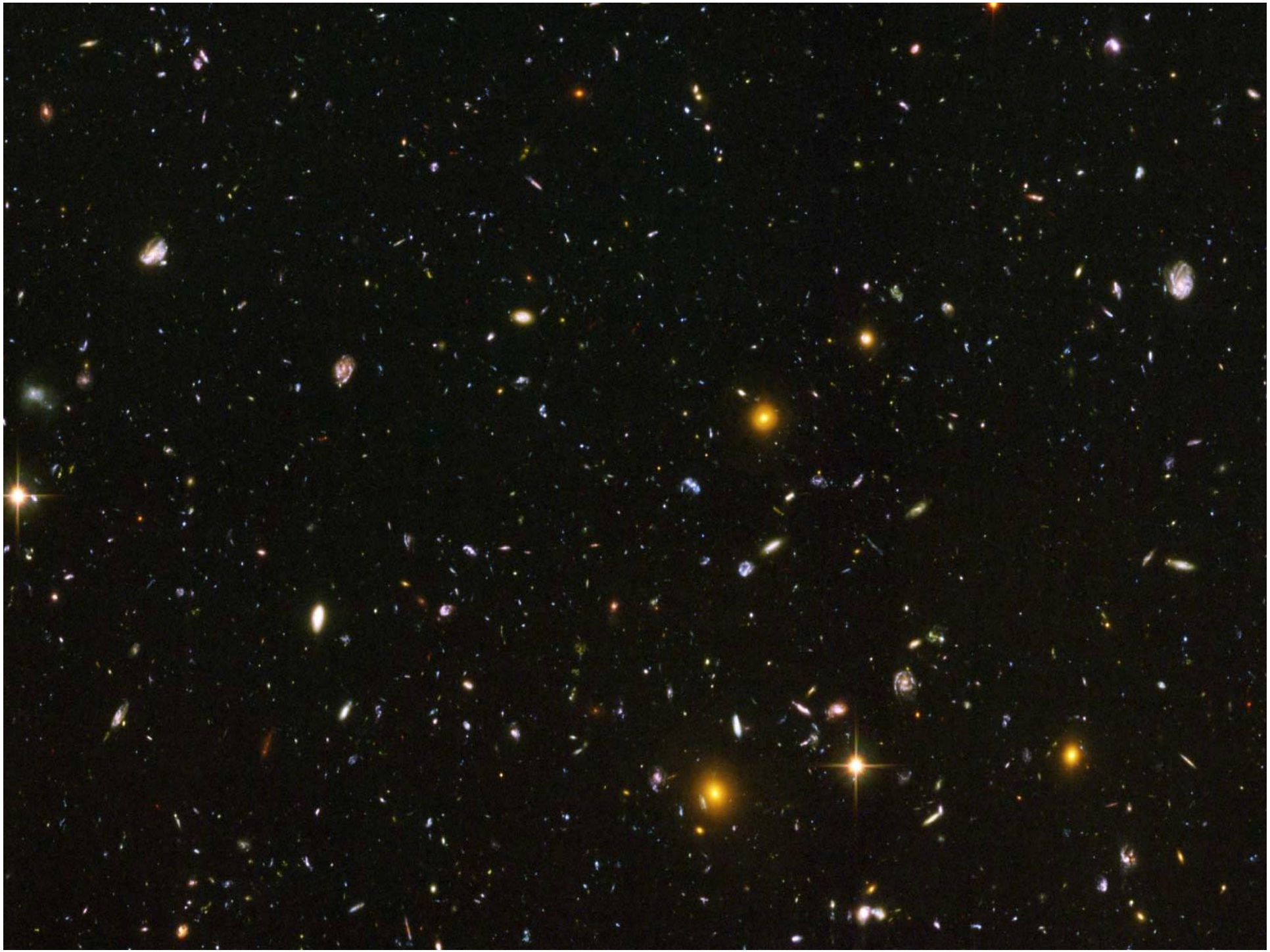
Di tích của tạo hóa

Реликты Творения

創建遺物, 작성의 유적

Reliques de la Création

Professor George F. Smoot
IEU & Ewha University, Seoul
Physics Department & LBNL
University of California at Berkeley
Chaires Blaise Pascal – PCCP
Université Sorbonne Paris Cité –
Université Paris Diderot - APC
EUL Moscow State University



CSI Primary Tool:

밖으로 보기 공간으로
또한 때 맞추어 회고하고 있다

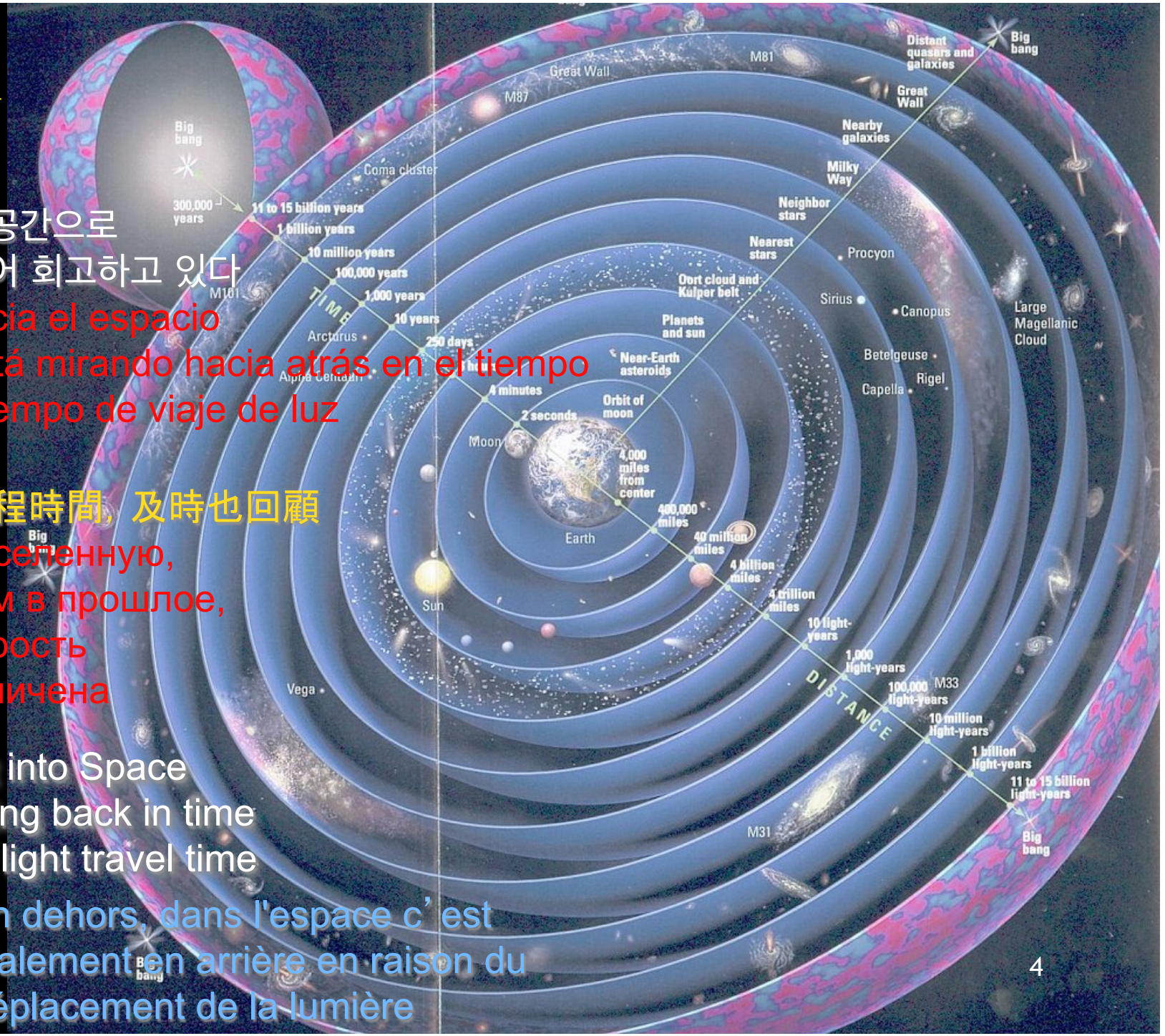
Mirando hacia el espacio
También está mirando hacia atrás en el tiempo
Debido al tiempo de viaje de luz

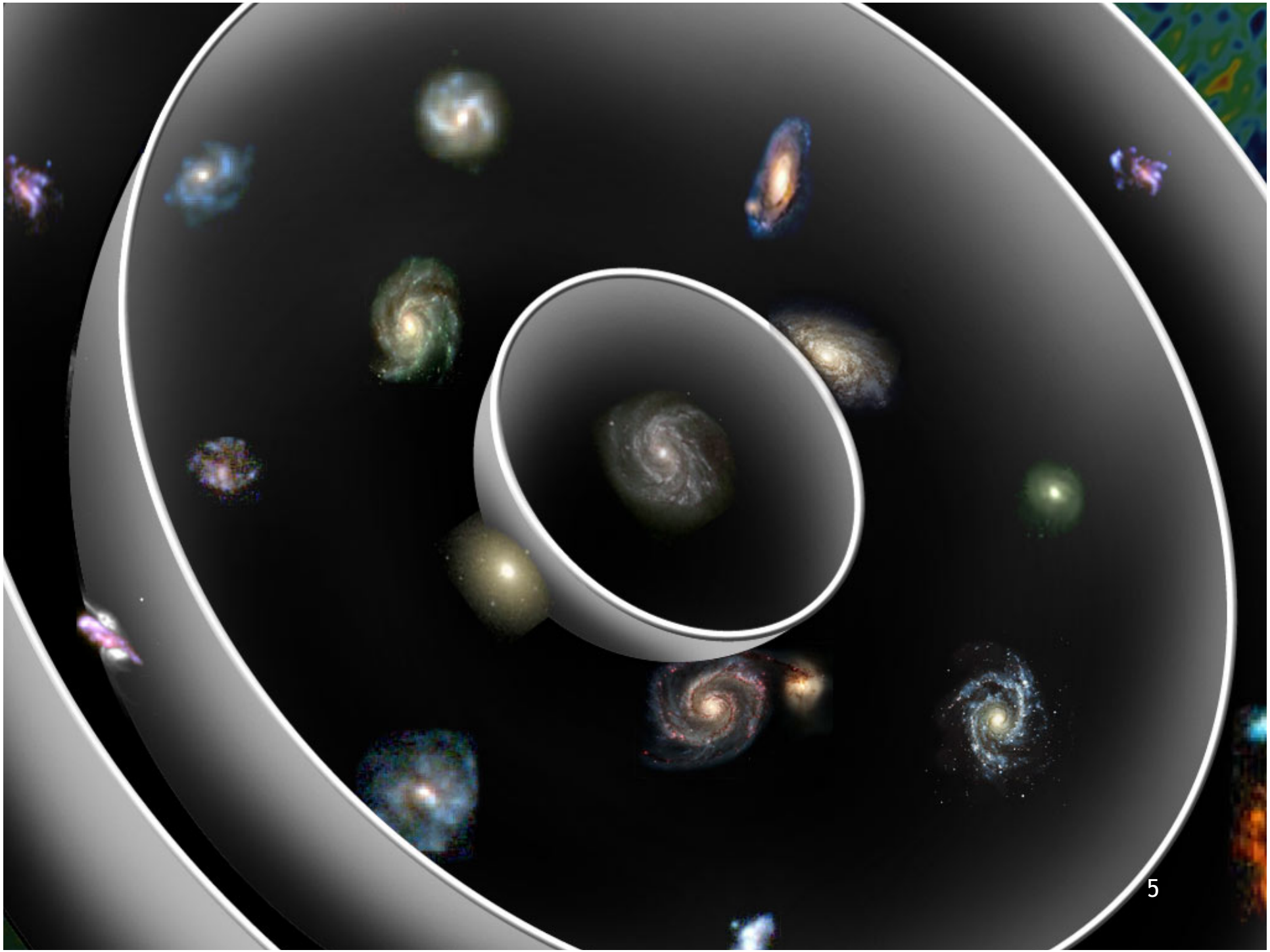
查找到空間
由於輕的行程時間，及時也回顧

Глядя на Вселенную,
мы смотрим в прошлое,
так как скорость
света ограничена

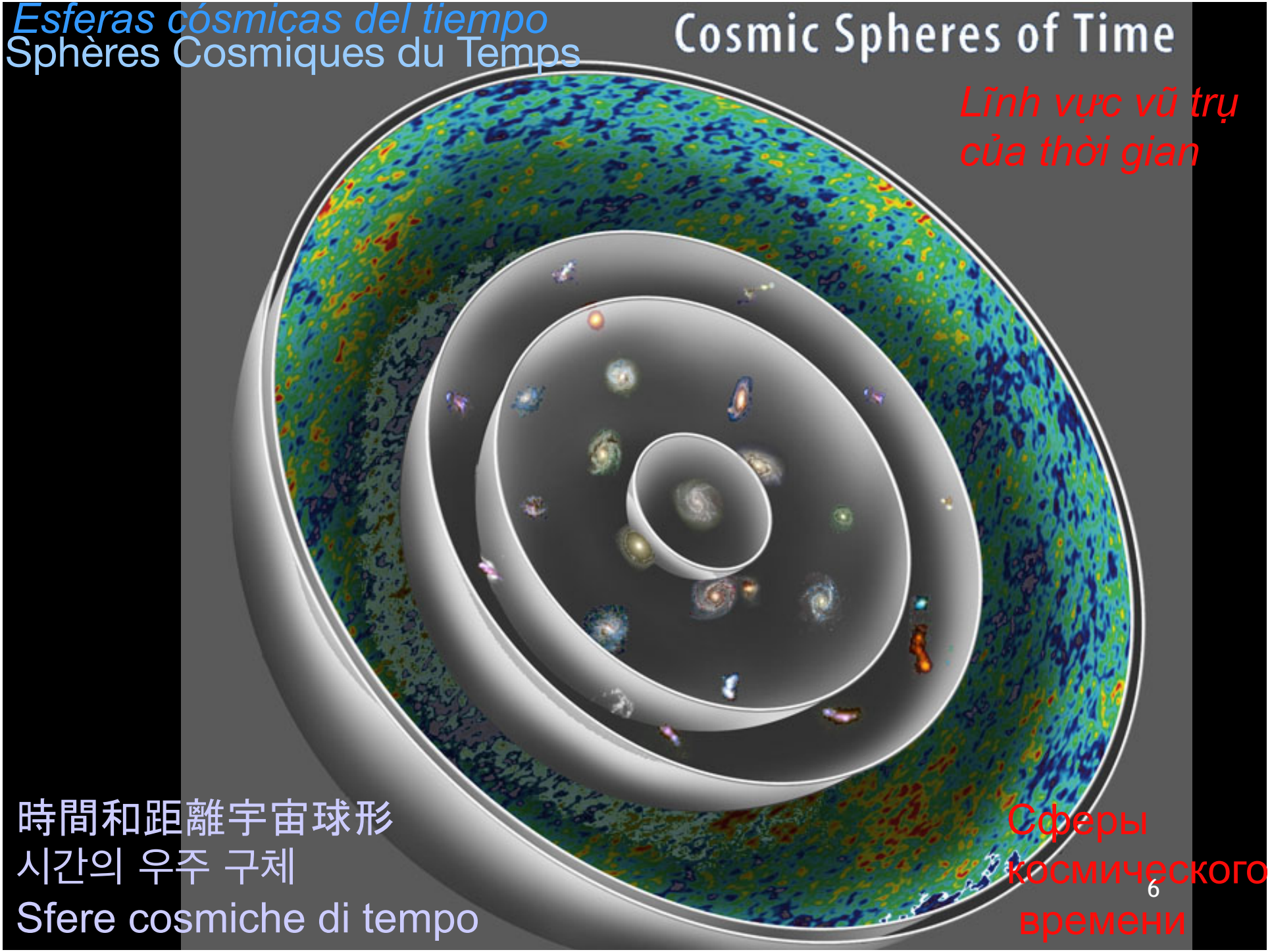
Looking out into Space
Is also looking back in time
Because of light travel time

Regarder en dehors, dans l'espace c'est
regarder également en arrière en raison du
temps de déplacement de la lumière





Esferas cósmicas del tiempo
Sphères Cosmiques du Temps

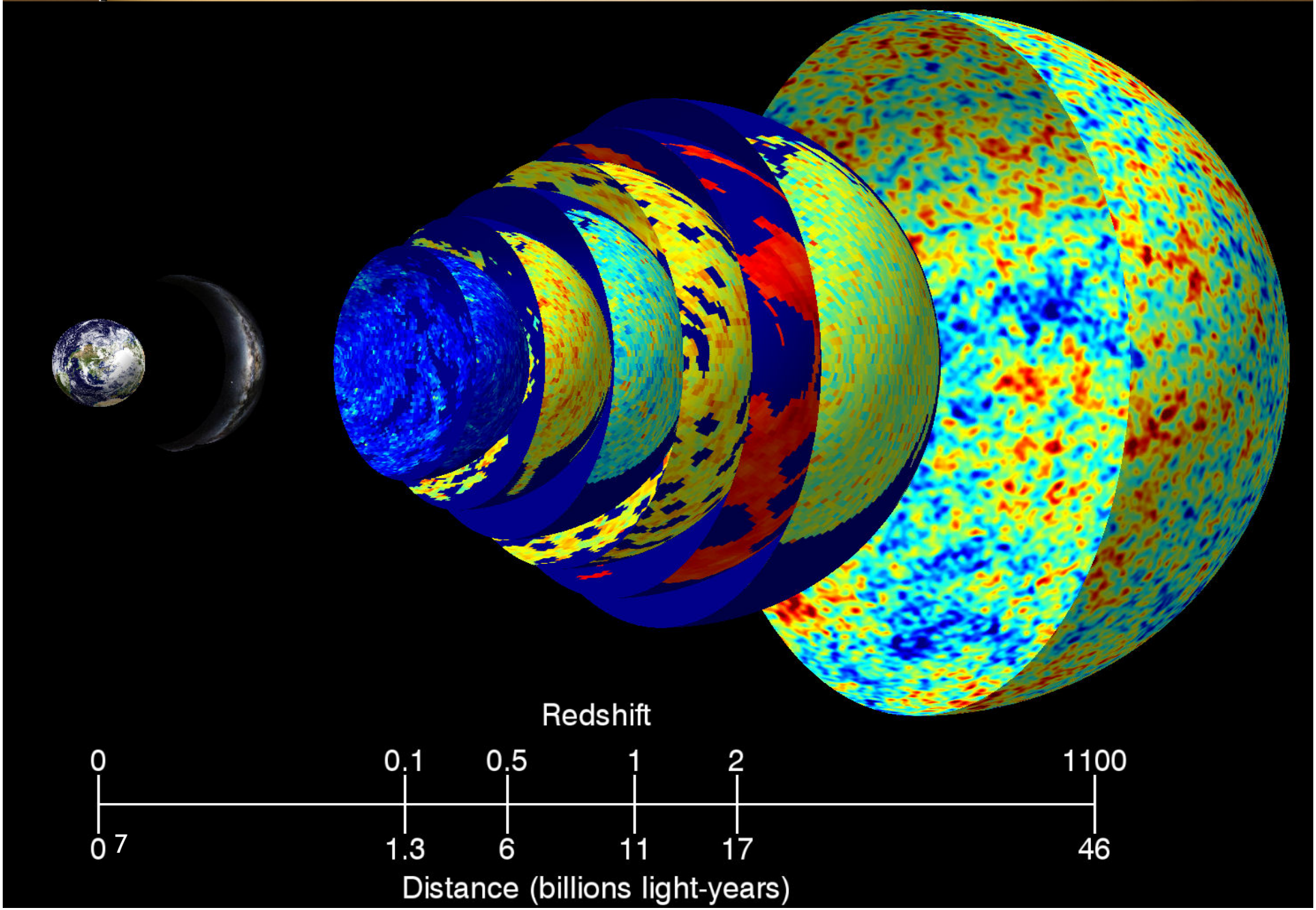


Lĩnh vực vũ trụ của thời gian

時間和距離宇宙球形
시간의 우주 구체
Sfere cosmiche di tempo

Сферы космического времени

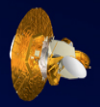
Maps of Universe vs. distance/redshift/time



CMB Missions Revolutionise Our Understanding of the Universe

PLANCK

1989



2000

2009

COBE

WMAP

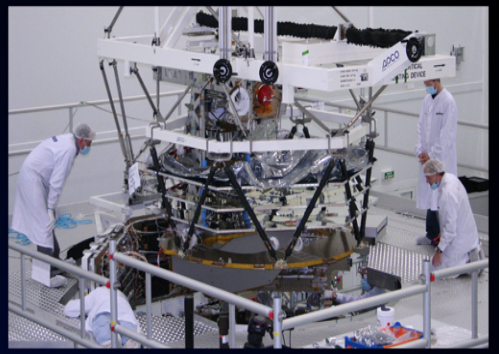
PLANCK

W-band temperature anisotropy

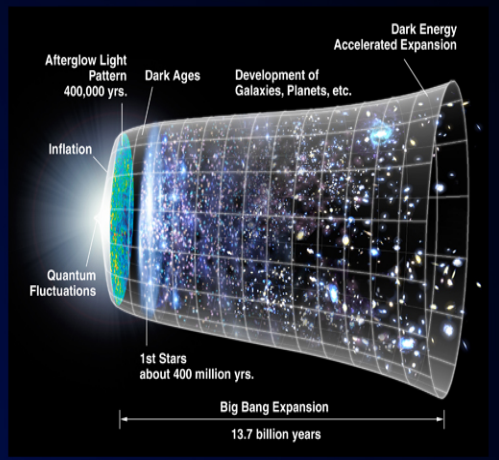
Internal Linear Combination of 5 bands, smoothed

Simulated temperature anisotropy

Simulated temperature and polarisation anisotropy

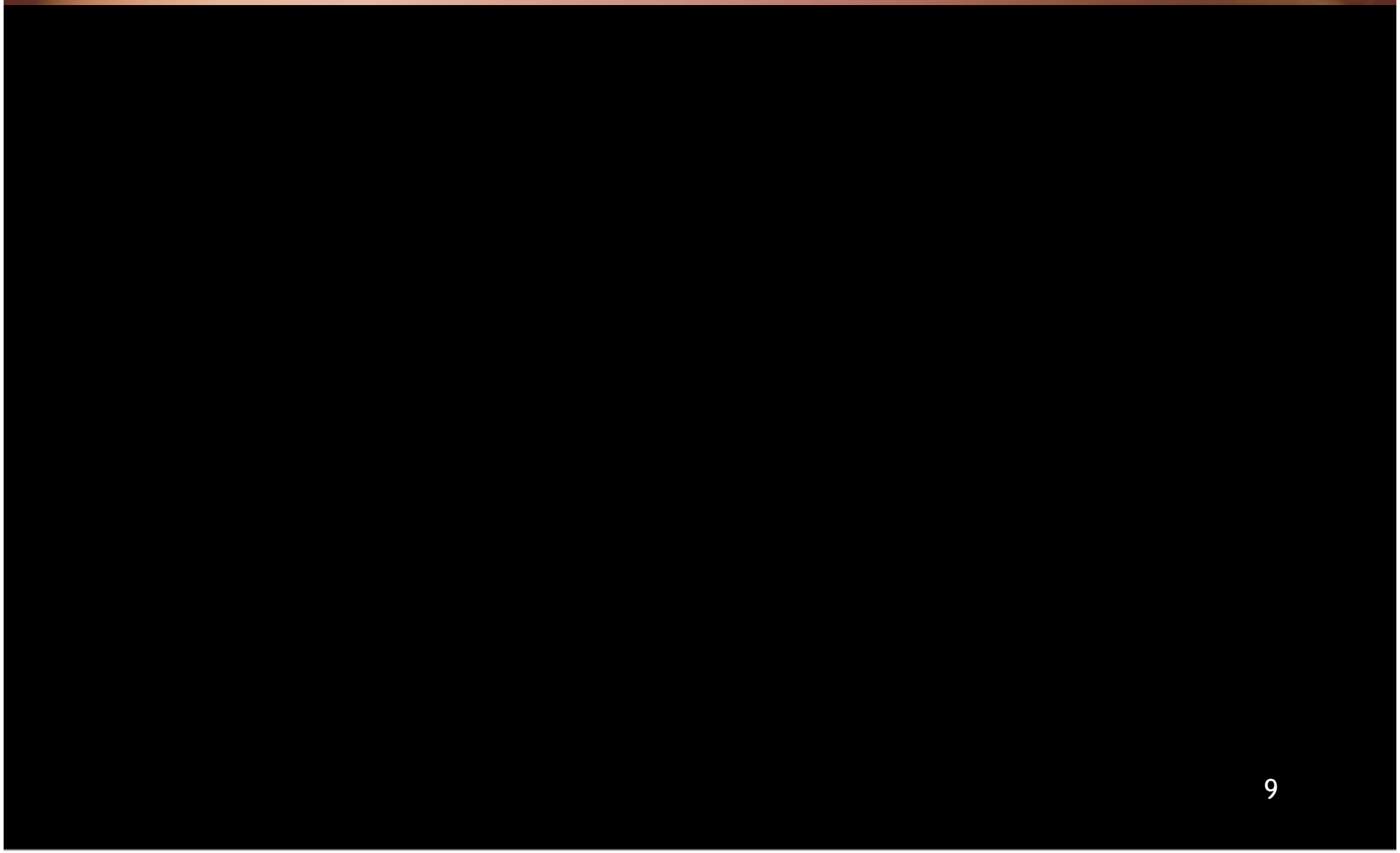


Planck spacecraft in clean assembly at Alcatel Alenia Space in January 2007

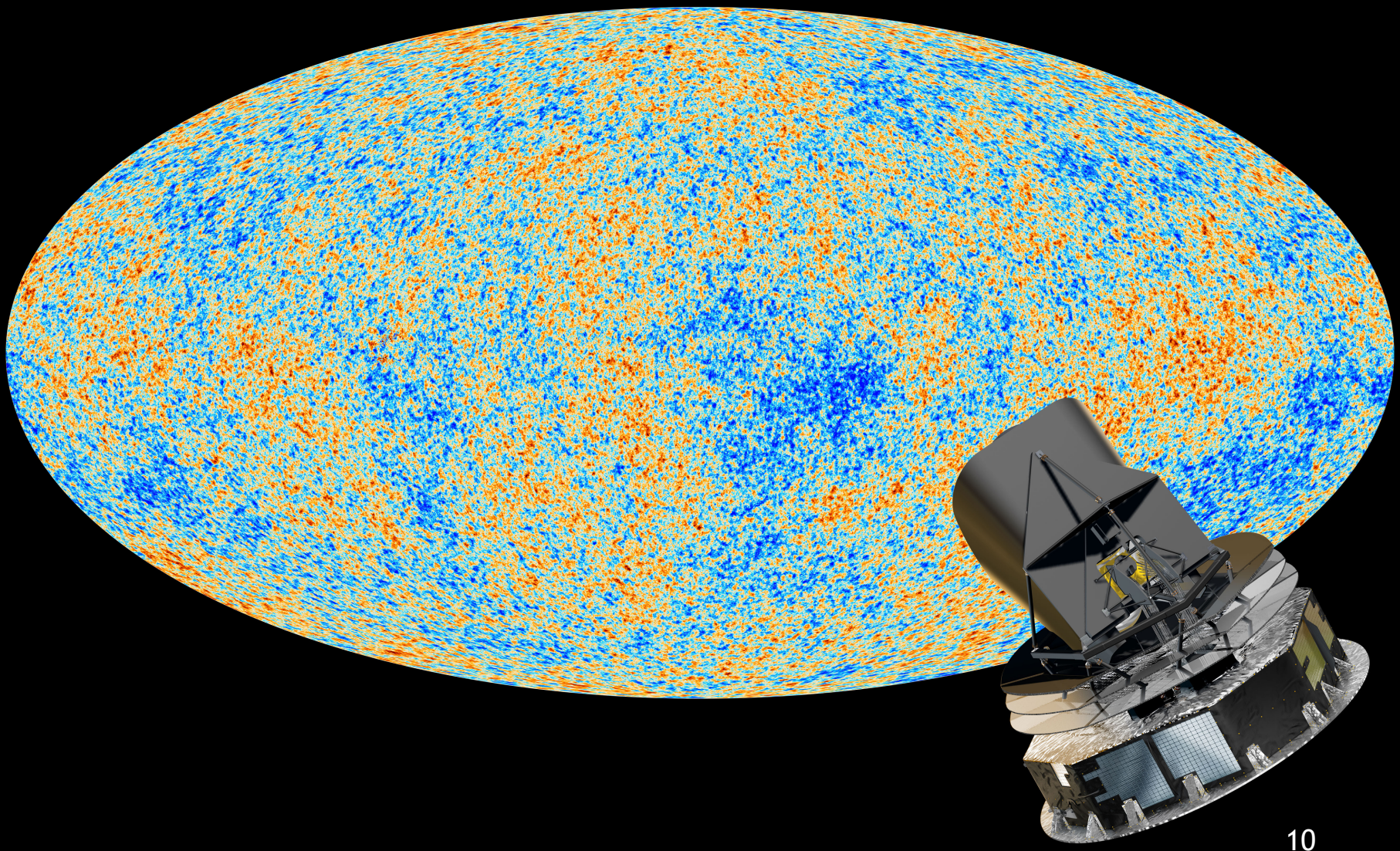


NASA esa ALCATEL ALENIA SPACE
An Alcatel/Finmeccanica company

Planck Maps the Microwave Sky
Planck trace le ciel de micro-onde

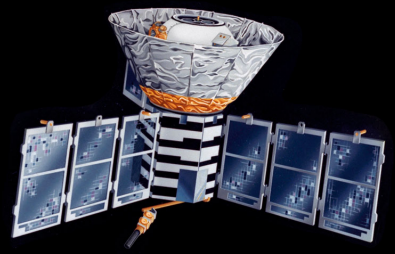


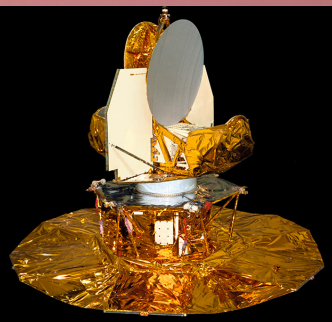
Planck 2013 CMB Map

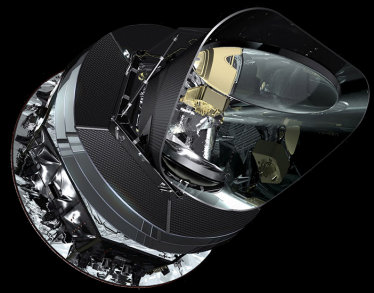


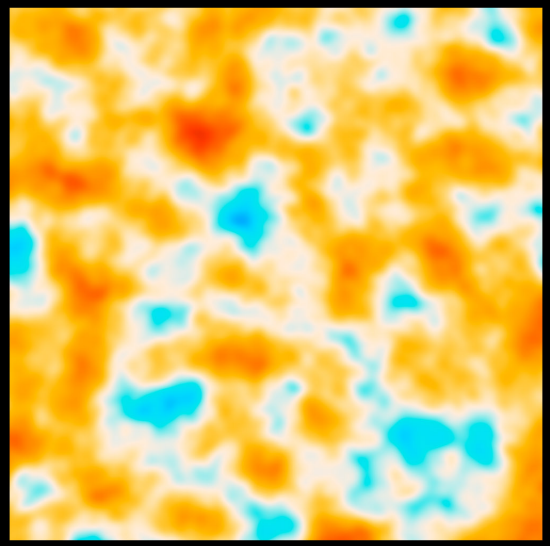
Vues avec l'augmentation de résolution

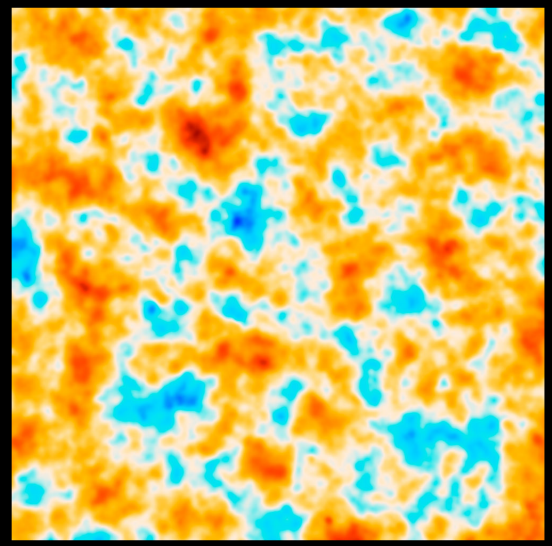
Higher Resolution Views









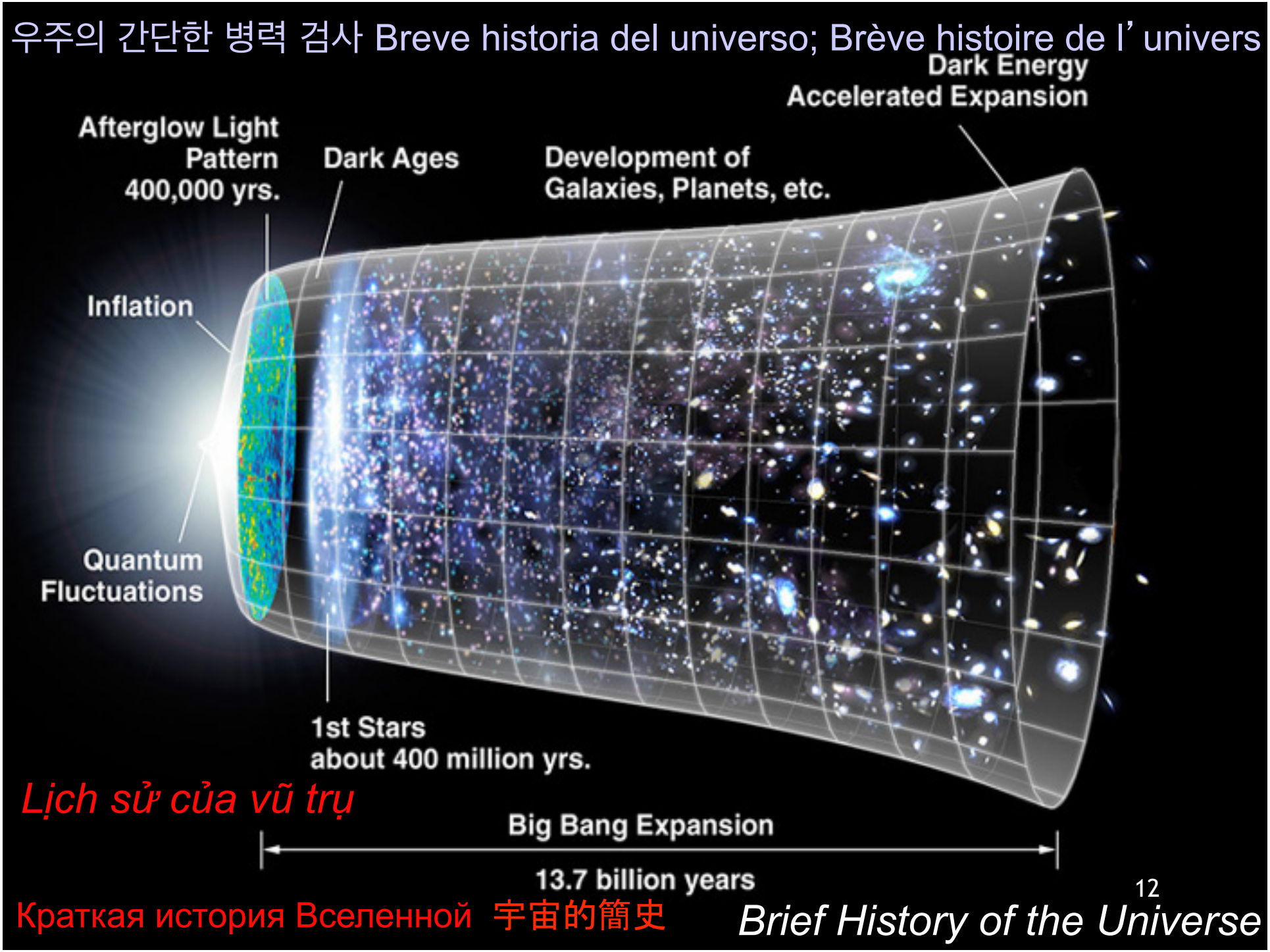


COBE

WMAP

Planck

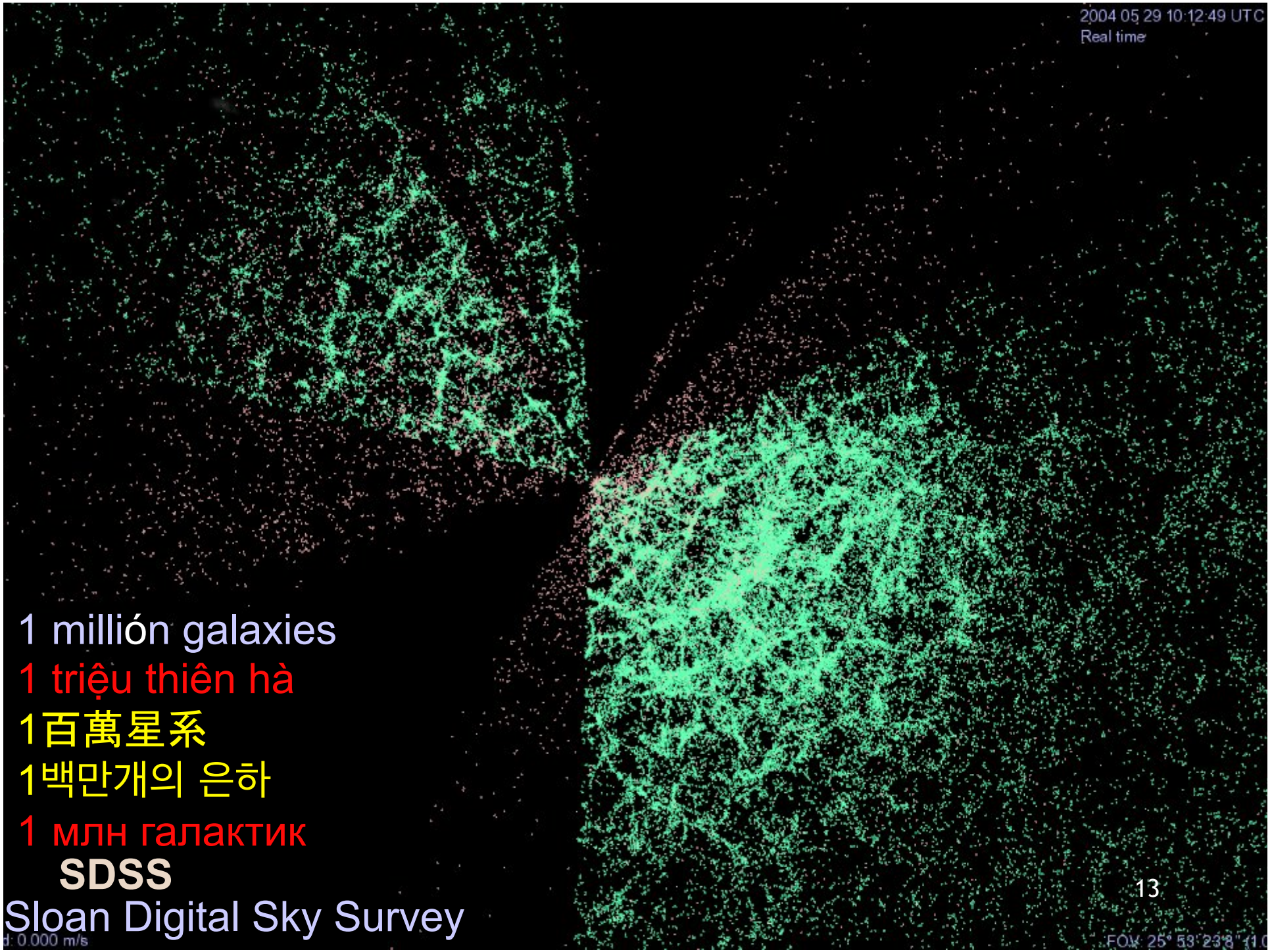
우주의 간단한 병력 검사 Breve historia del universo; Brève histoire de l’univers

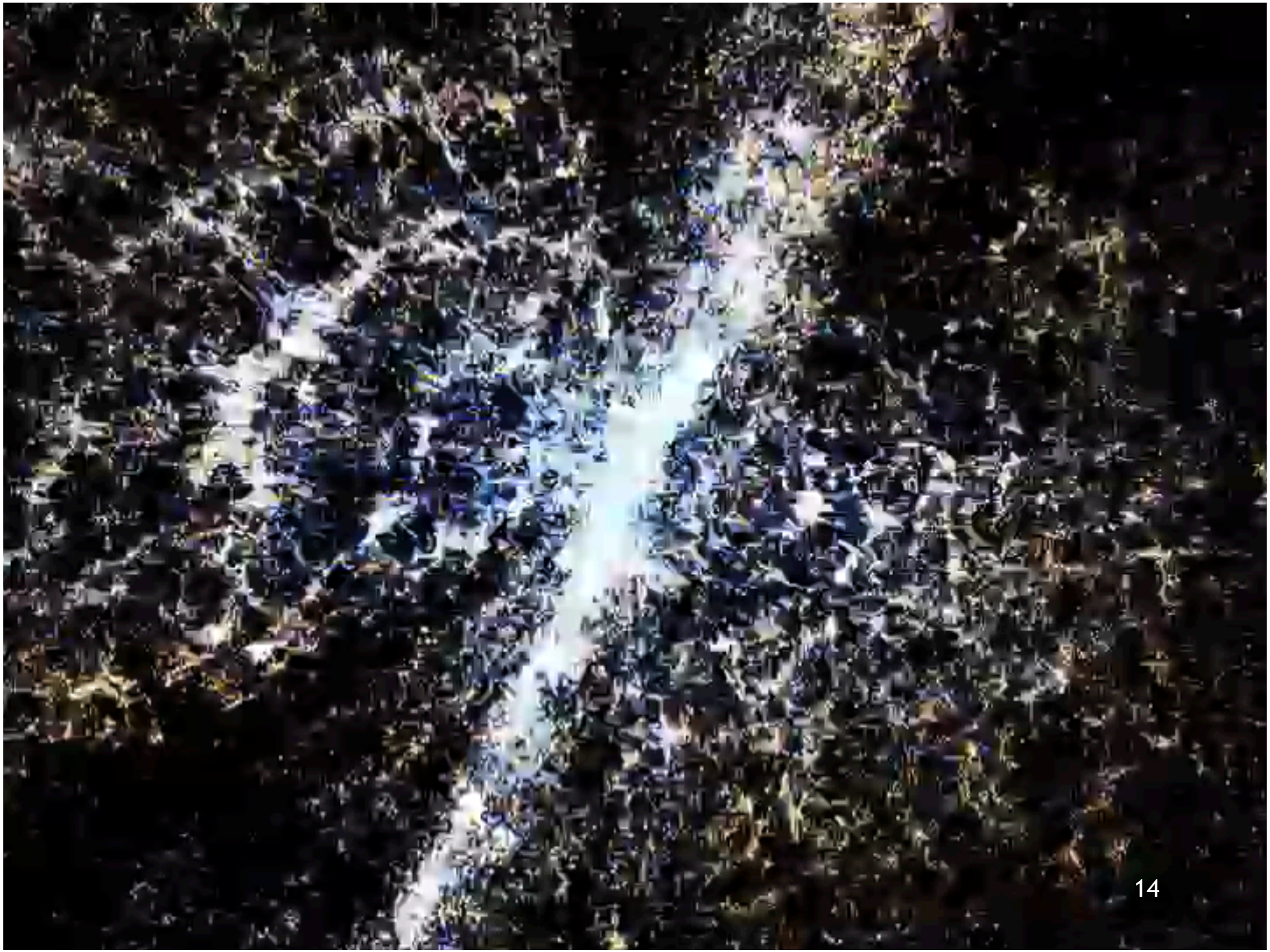


Lịch sử của vũ trụ

Краткая история Вселенной 宇宙的簡史

Brief History of the Universe

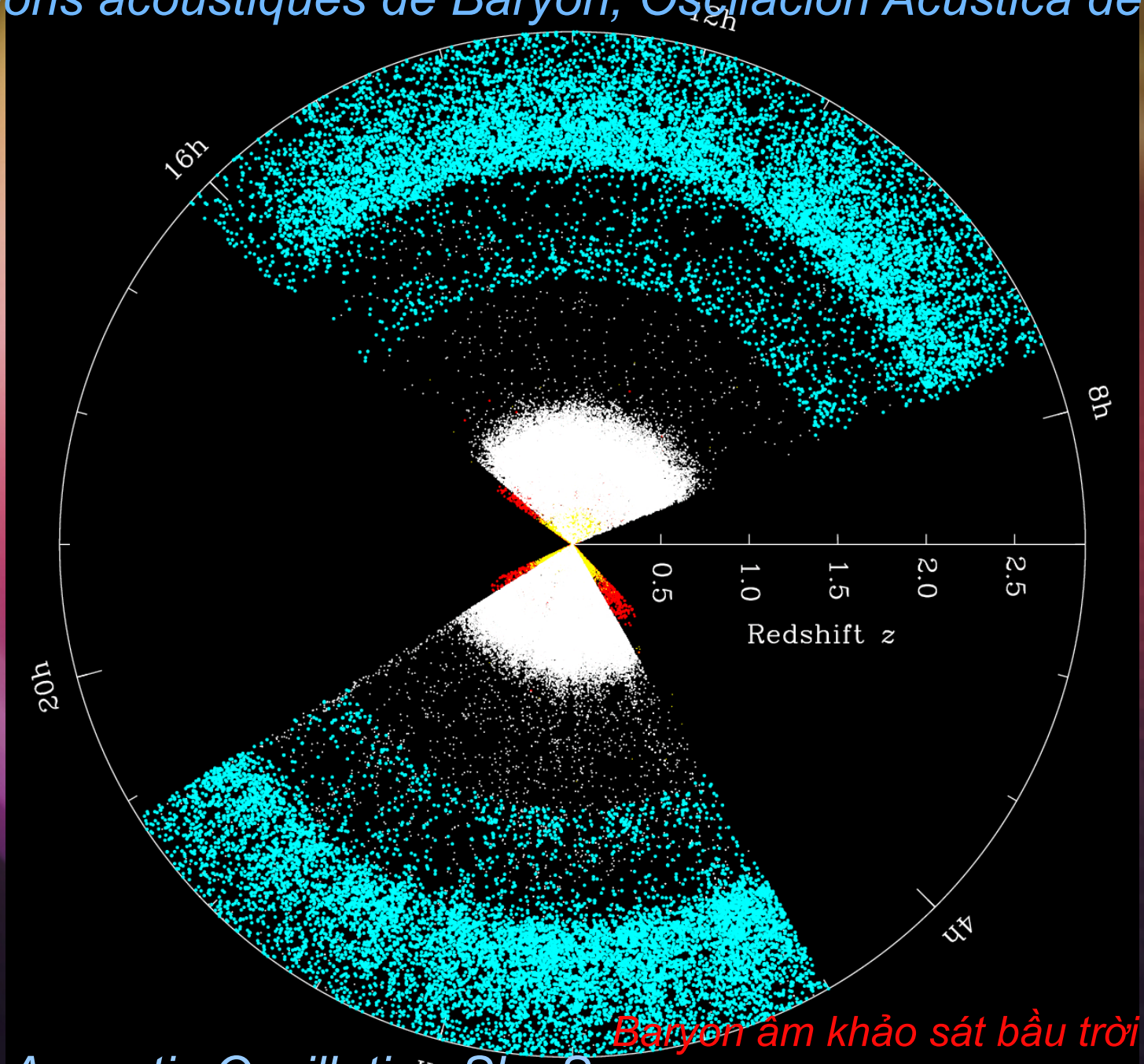

2004 05 29 10:12:49 UTC
Real time
1 millión galaxies
1 triệu thiên hà
1百萬星系
1백만개의 은하
1 млн галактик
SDSS
Sloan Digital Sky Survey
13



2 Degree Field of View Survey Enquête de champ visuel de 2 degr
2 Bằng Trường nhìn Khảo sát Обзор области видимости 2 градусов
2度視野調査 Catalogo del Campo de visión 2

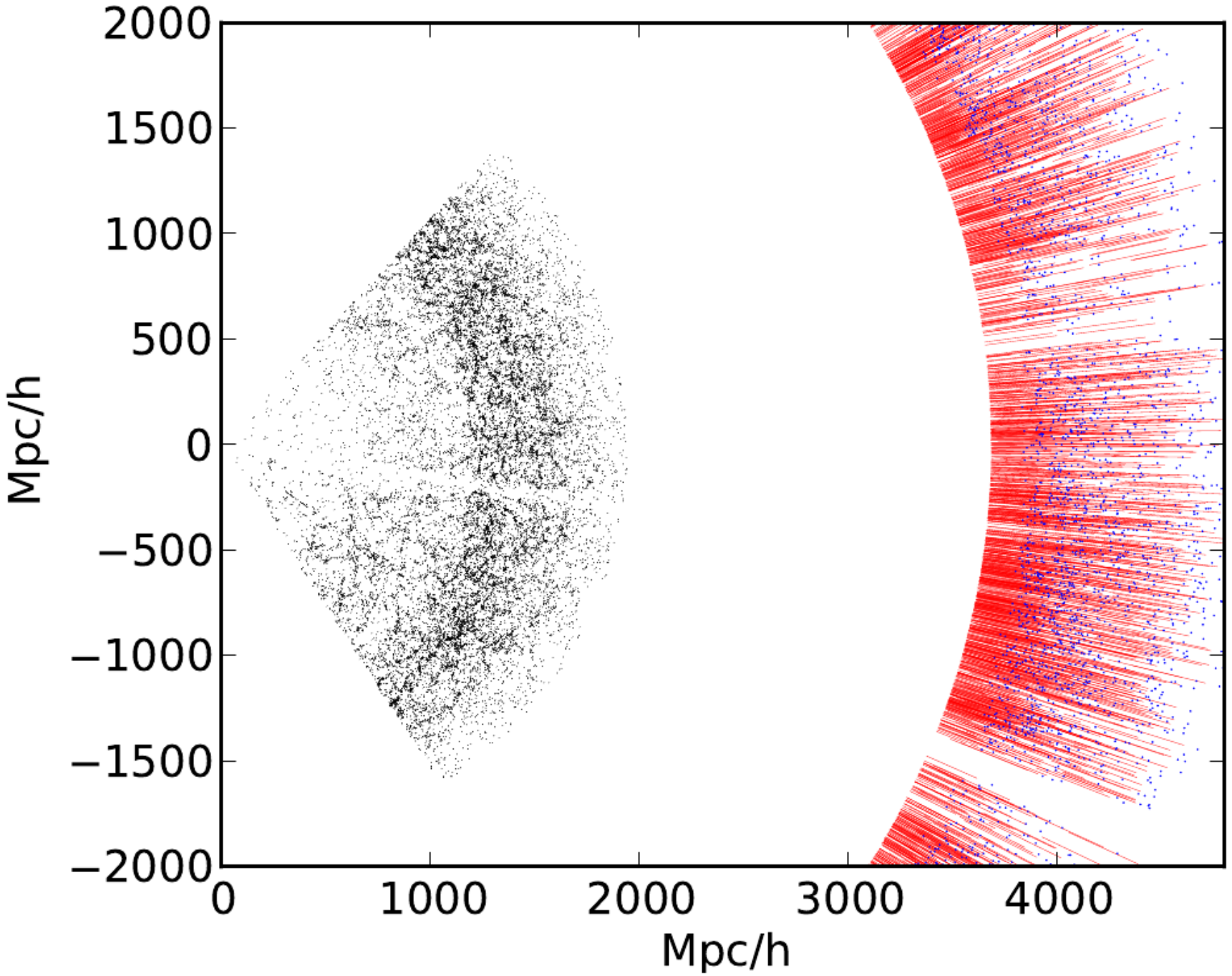
Oscillations acoustiques de Baryon; Oscilación Acústica de barione

BOSS
SDSS
III

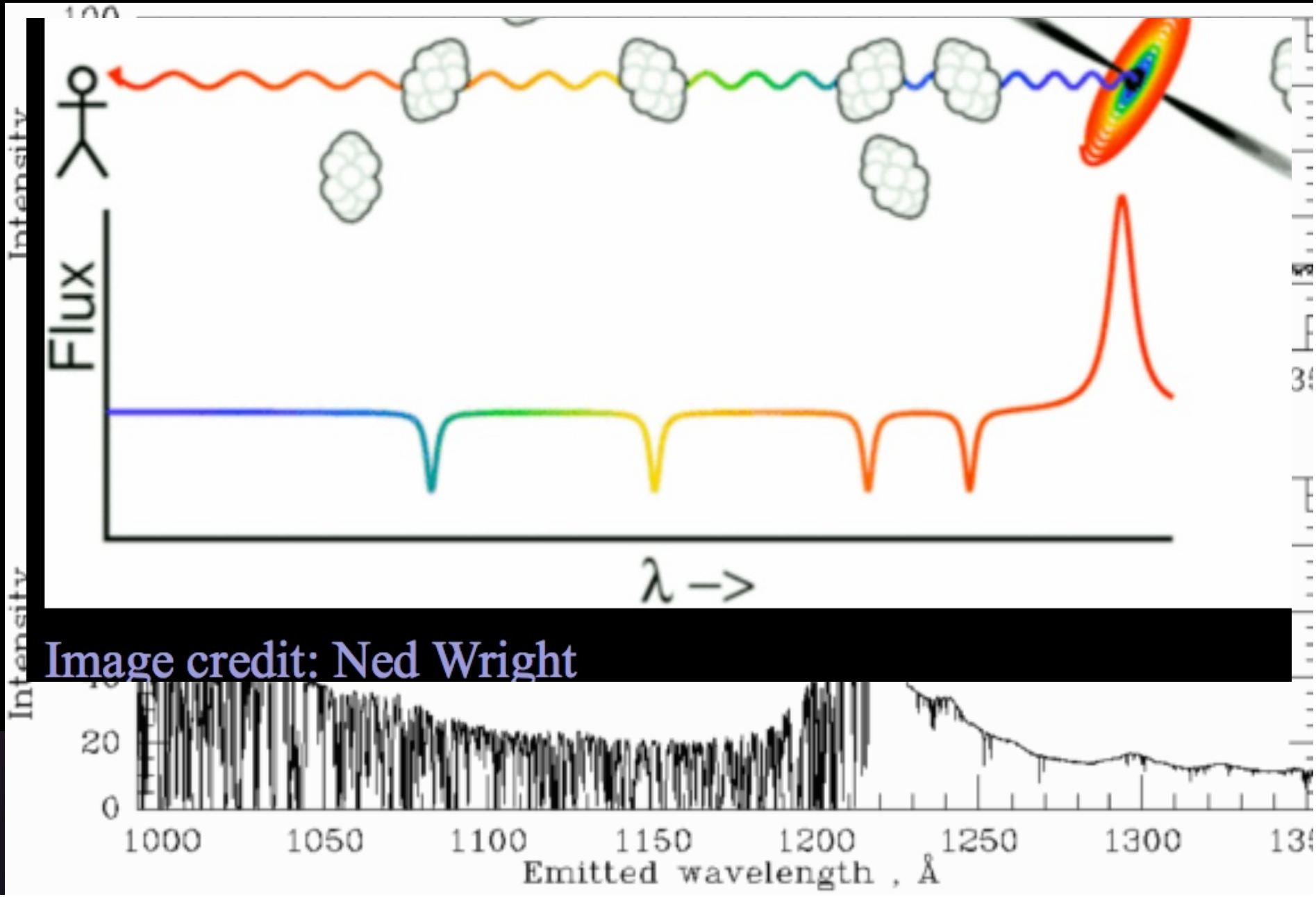


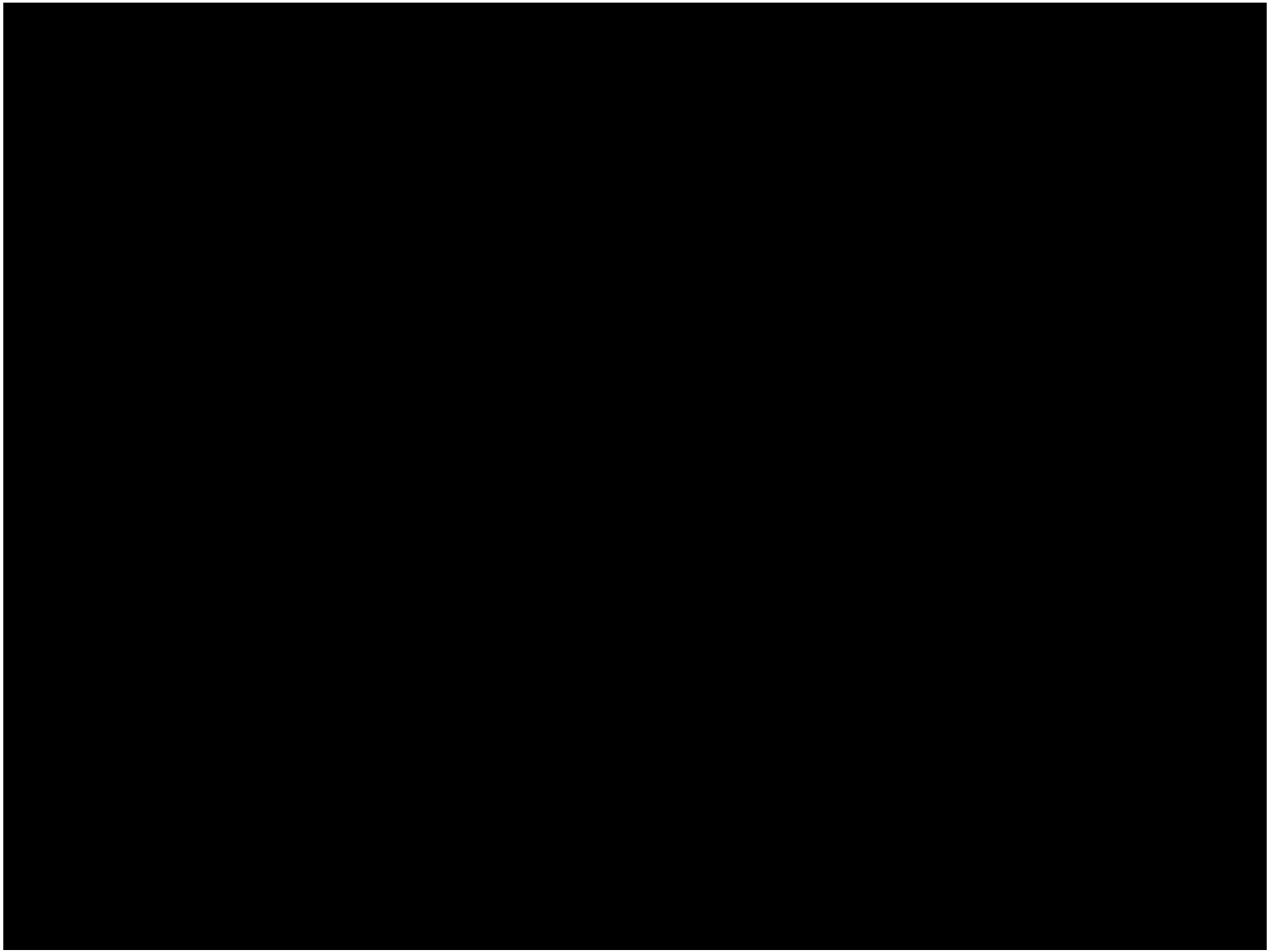
Baryon âm khảo sát bầu trời dao động

Baryon-Acoustic Oscillation Sky Survey


2000
1500
1000
500
0
−500
−1000
−1500
−2000
Mpc/h
0
1000
2000
3000
4000
Mpc/h

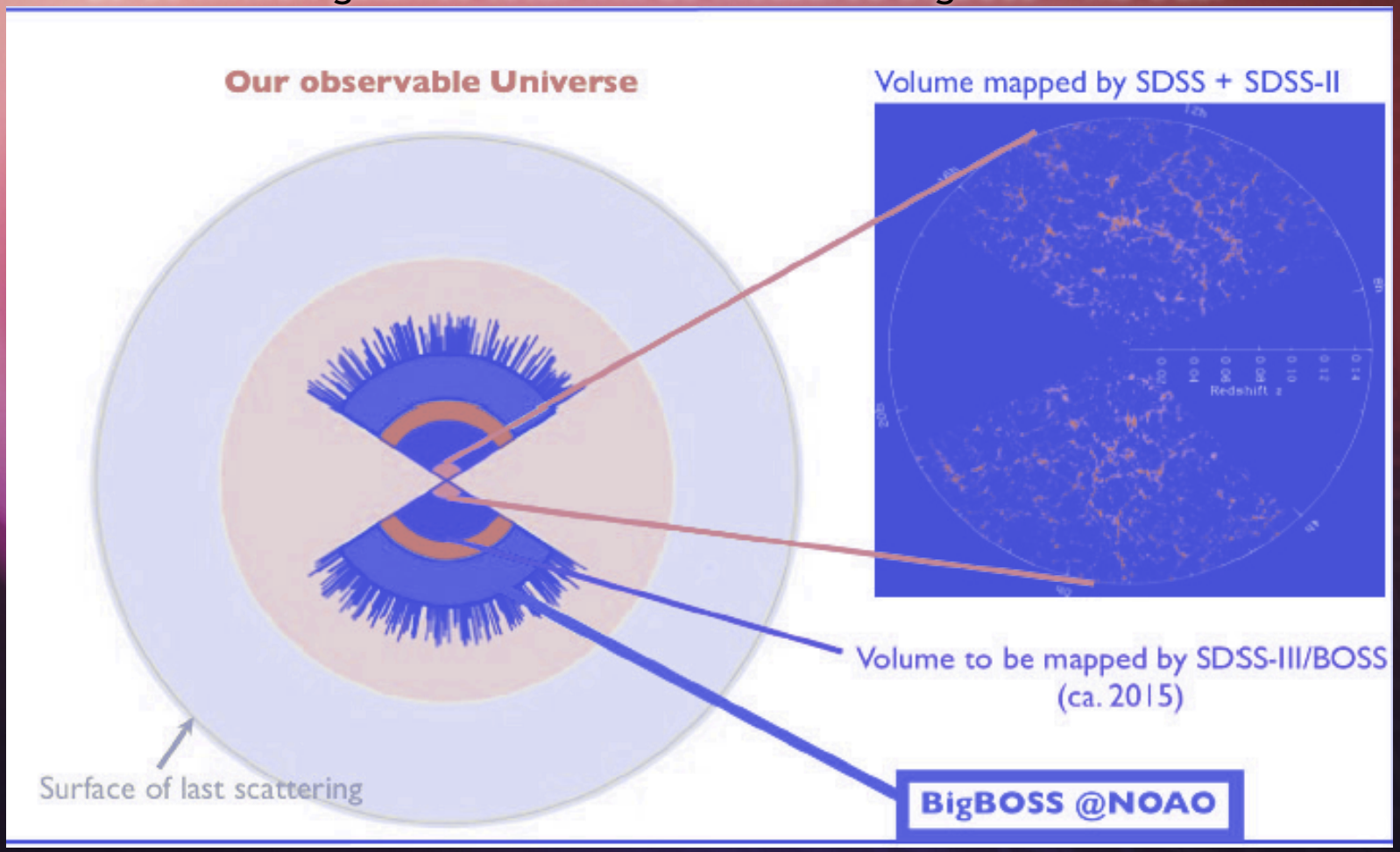
Lyman Alpha Forest





BigBOSS - largest spectroscopic survey ever

- BigBOSS -> MS-DESI will be the deepest mapping of our universe in galaxies and quasars.
  - more than 1/2 the sky is covered, from z=0.2 to 2, or more than halfway back to the big bang in time.
  - 20-50 million galaxies total will be measured BigBOSS-> MS-DESI



China a major participant in MS-DESI –a large international collaboration

Put in primordial fluctuations, let gravity take its course 放置在原始波動和讓重力採取其路線

Закладываем первичные флуктуации, а далее всем управляет гравитация

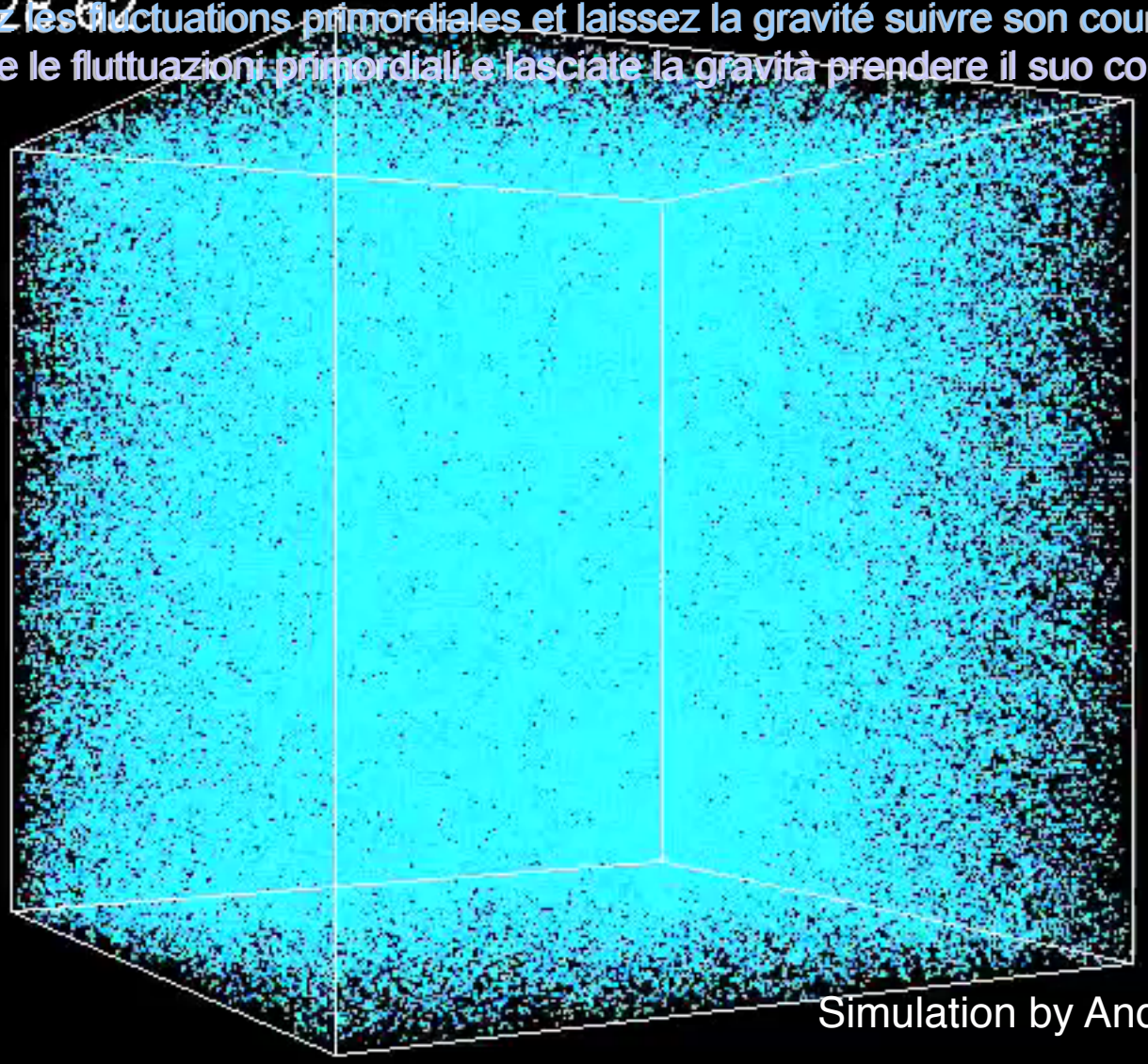
원초적인 동요에서 둬 중력을 취한다 그것의 과정을 시키거든

Fluctuaciones primordiales y despues la gravedad toma su curso

Đưa vào biến động nguyên thủy, để cho trọng lực có khóa học của mình

Entrez les fluctuations primordiales et laissez la gravité suivre son cours

Mettete le fluttuazioni primordiali e lasciate la gravità prendere il suo corso



Simulation by Andrey Kravtsov

Распределение Материи по сравнению с масштабом

Distribution de matière versus Échelle

問題配電器與縮放比例

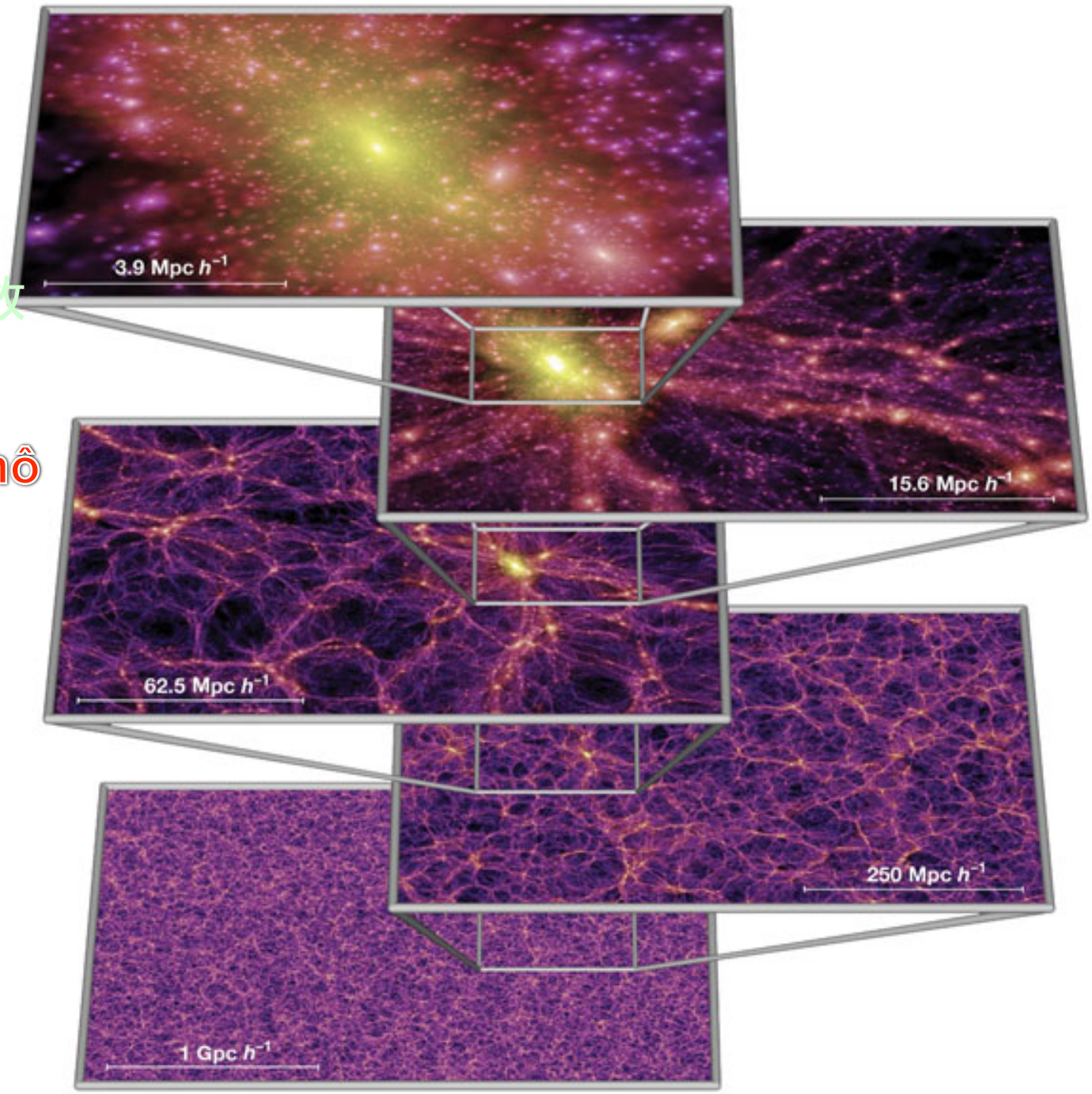
Phân phối vấn đề so với quy mô

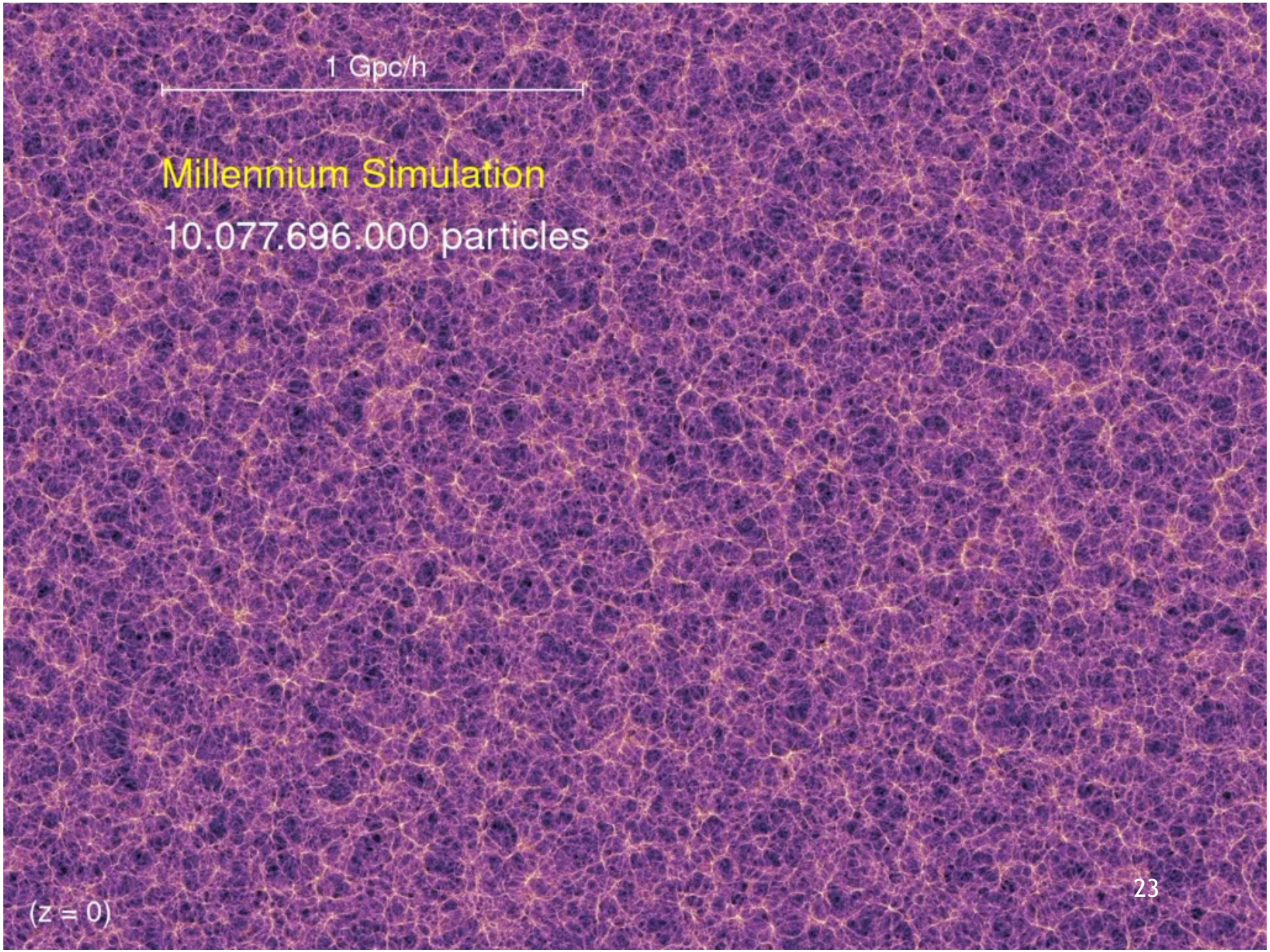
Matter distribution versus scale

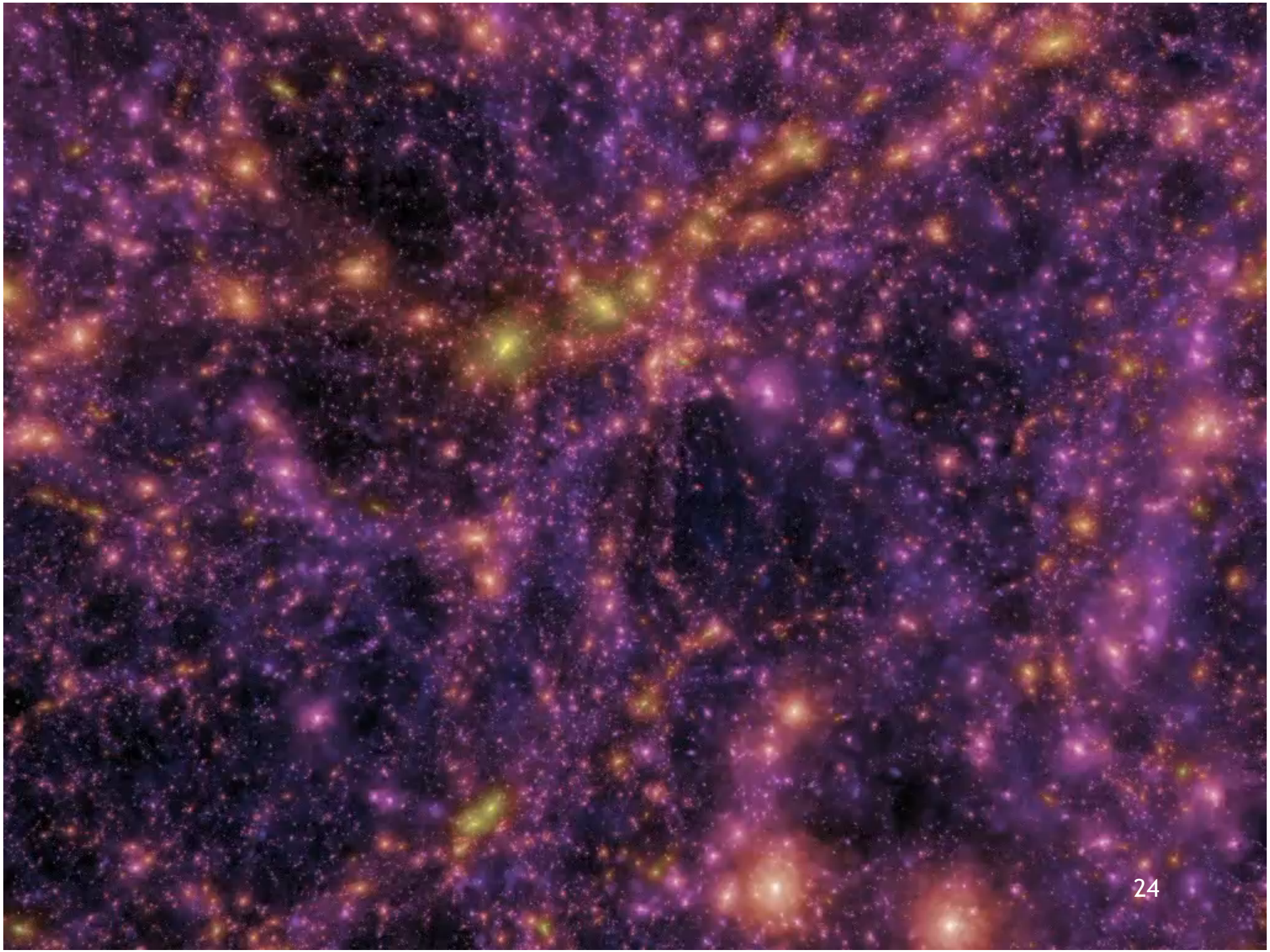
Distribución de la materia en comparación con la escala

배급 대 가늠자사정

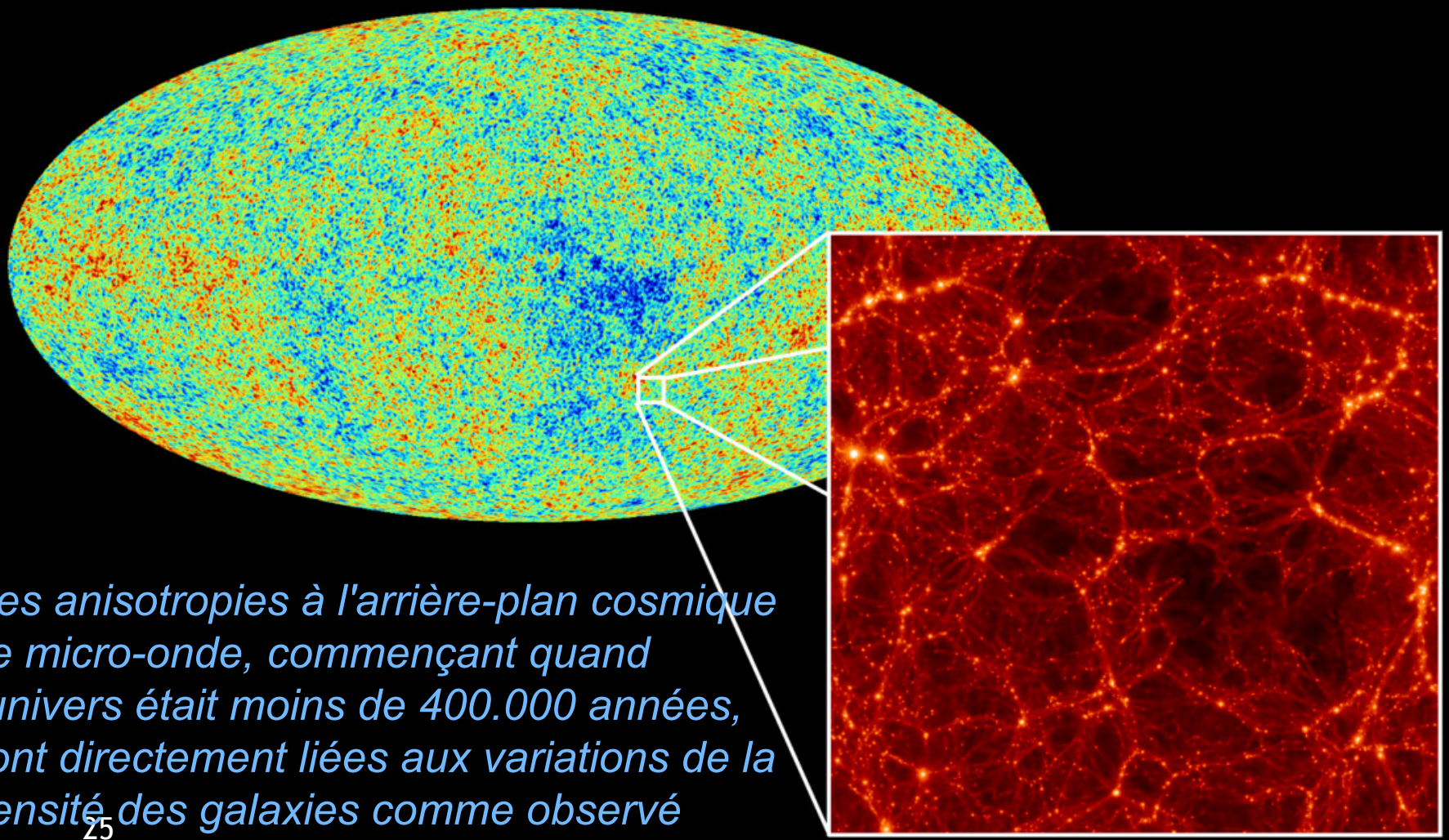
Distribuzione della materia versus scala




1 Gpc/h
Millennium Simulation
10.077.696.000 particles
(z = 0)



Anisotropies in the cosmic microwave background, originating when the universe was less than 400,000 years old, are directly related to variations in the density of galaxies as observed today.



Des anisotropies à l'arrière-plan cosmique de micro-onde, commençant quand l'univers était moins de 400.000 années, sont directement liées aux variations de la densité des galaxies comme observé aujourd'hui

History of the Universe

Historia del Universo

Lịch sử của vũ trụ

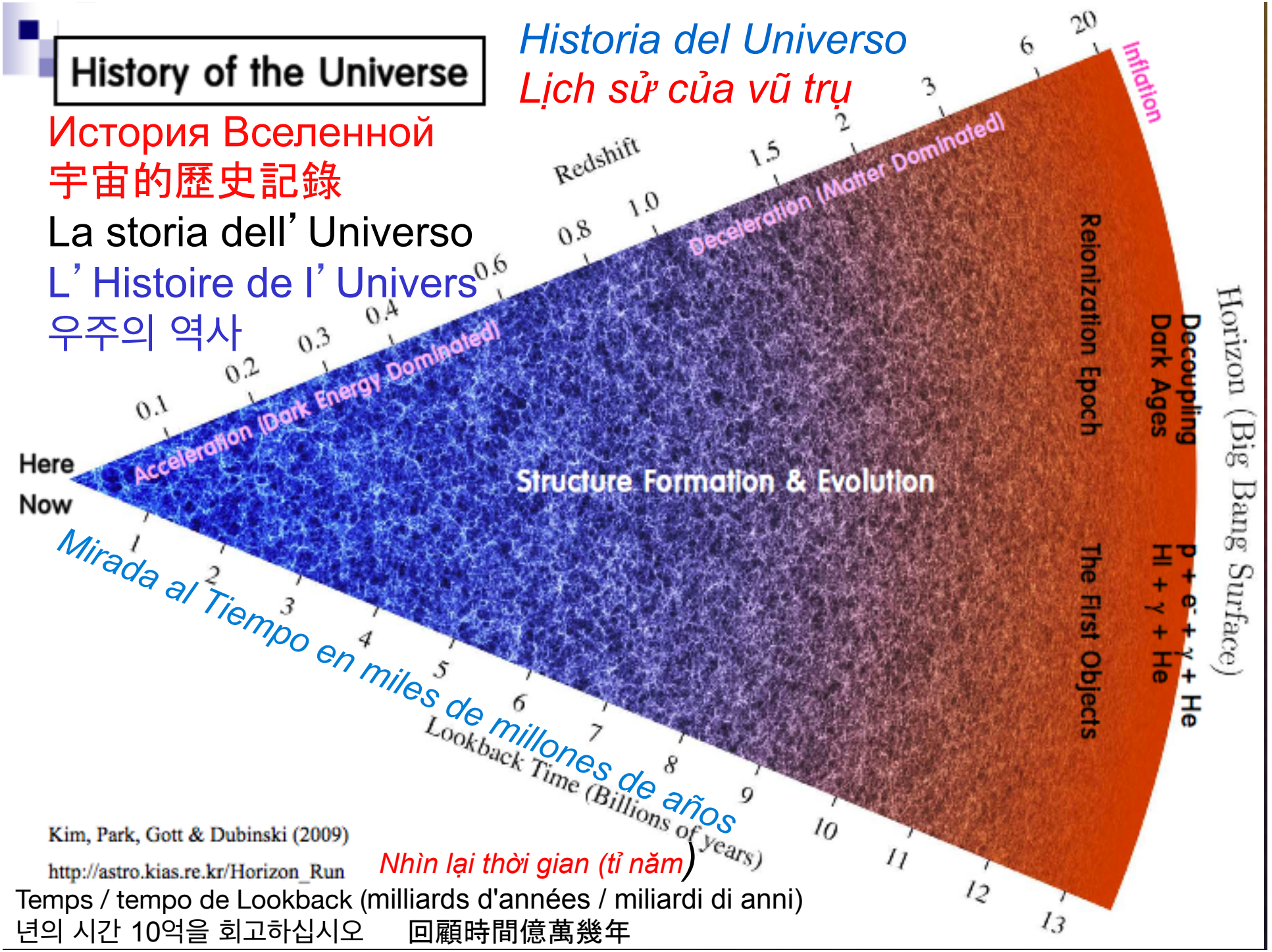
История Вселенной

宇宙的歷史記錄

La storia dell' Universo

L' Histoire de l' Univers

우주의 역사



Mirada al Tiempo en miles de millones de años

Kim, Park, Gott & Dubinski (2009)

http://astro.kias.re.kr/Horizon_Run

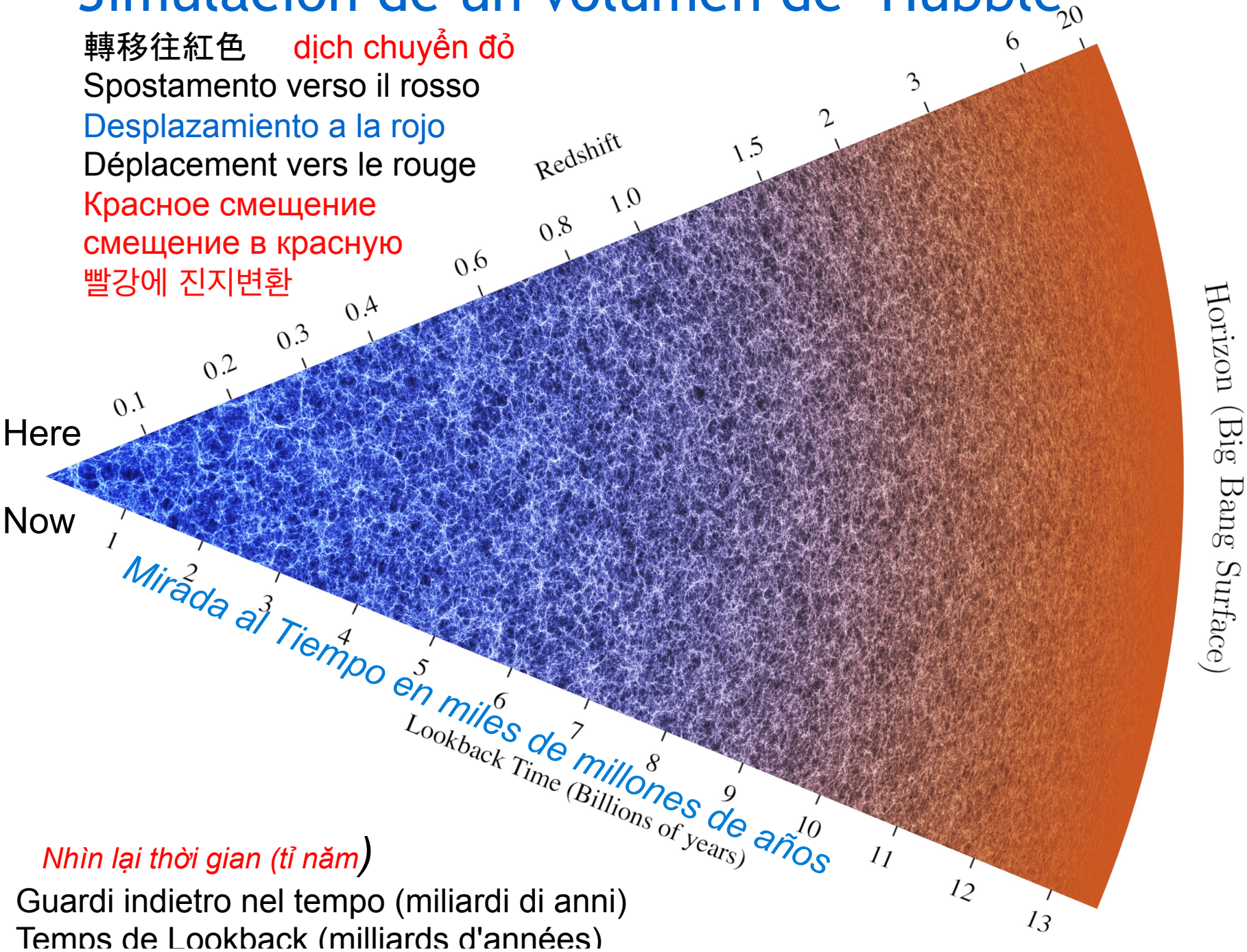
Nhìn lại thời gian (tỉ năm)

Temps / tempo de Lookback (milliards d'années / miliardi di anni)

년의 시간 10억을 회고하십시오　　回顧時間億萬幾年

Simulación de un volumen de Hubble

轉移往紅色 dịch chuyển đỏ
Spostamento verso il rosso
Desplazamiento a la rojo
Déplacement vers le rouge
Красное смещение
смещение в красную
빨강에 진지변환



Nhìn lại thời gian (tỉ năm)

Guardi indietro nel tempo (miliardi di anni)
Temps de Lookback (milliards d'années)

La grande era di scoperte si svela...

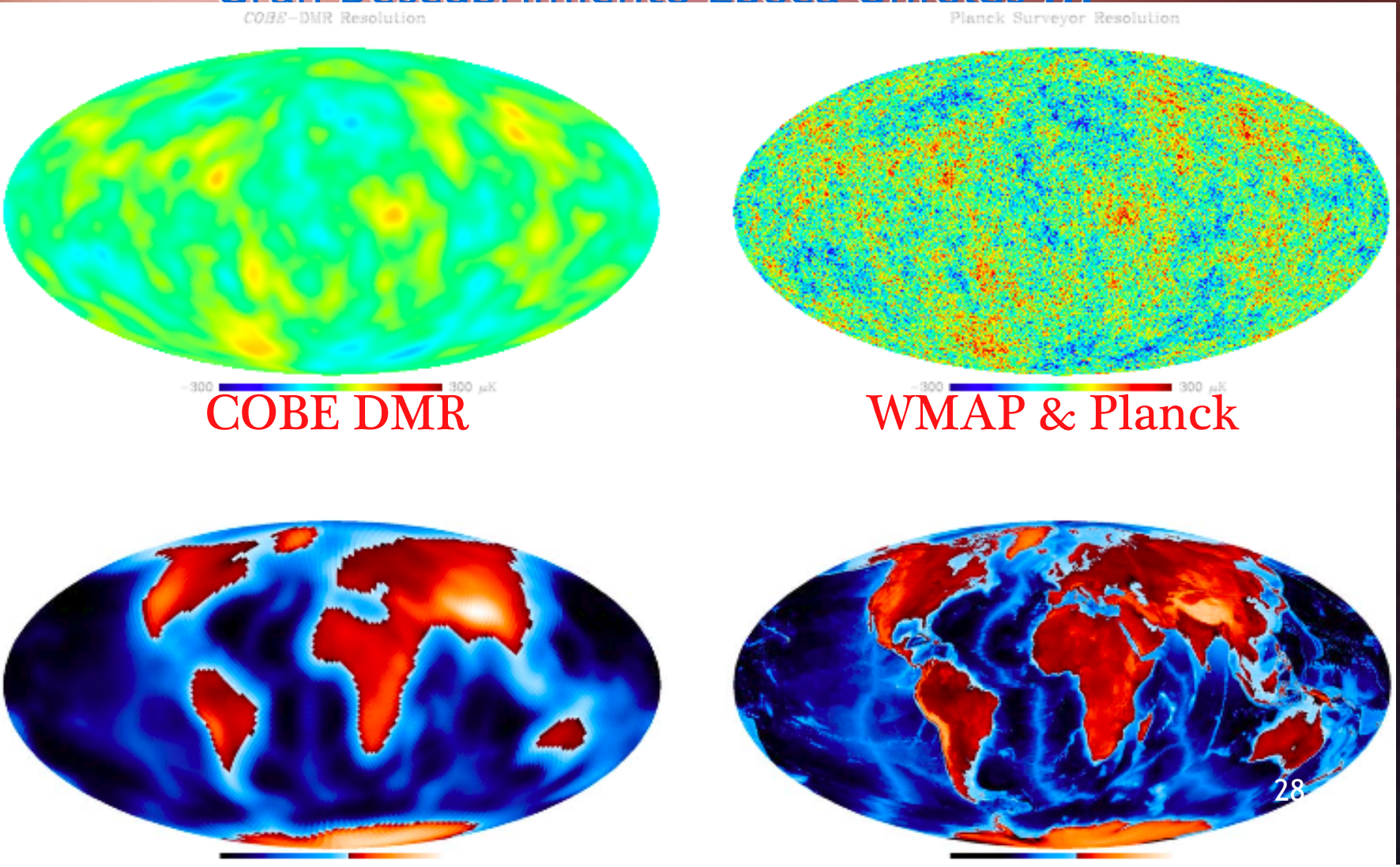
Грандиозная эра открытия раскрывает

중대한 발견 시대는 펼친다...　　巨大發現時代展開...

Great Discovery Era Unfolds...

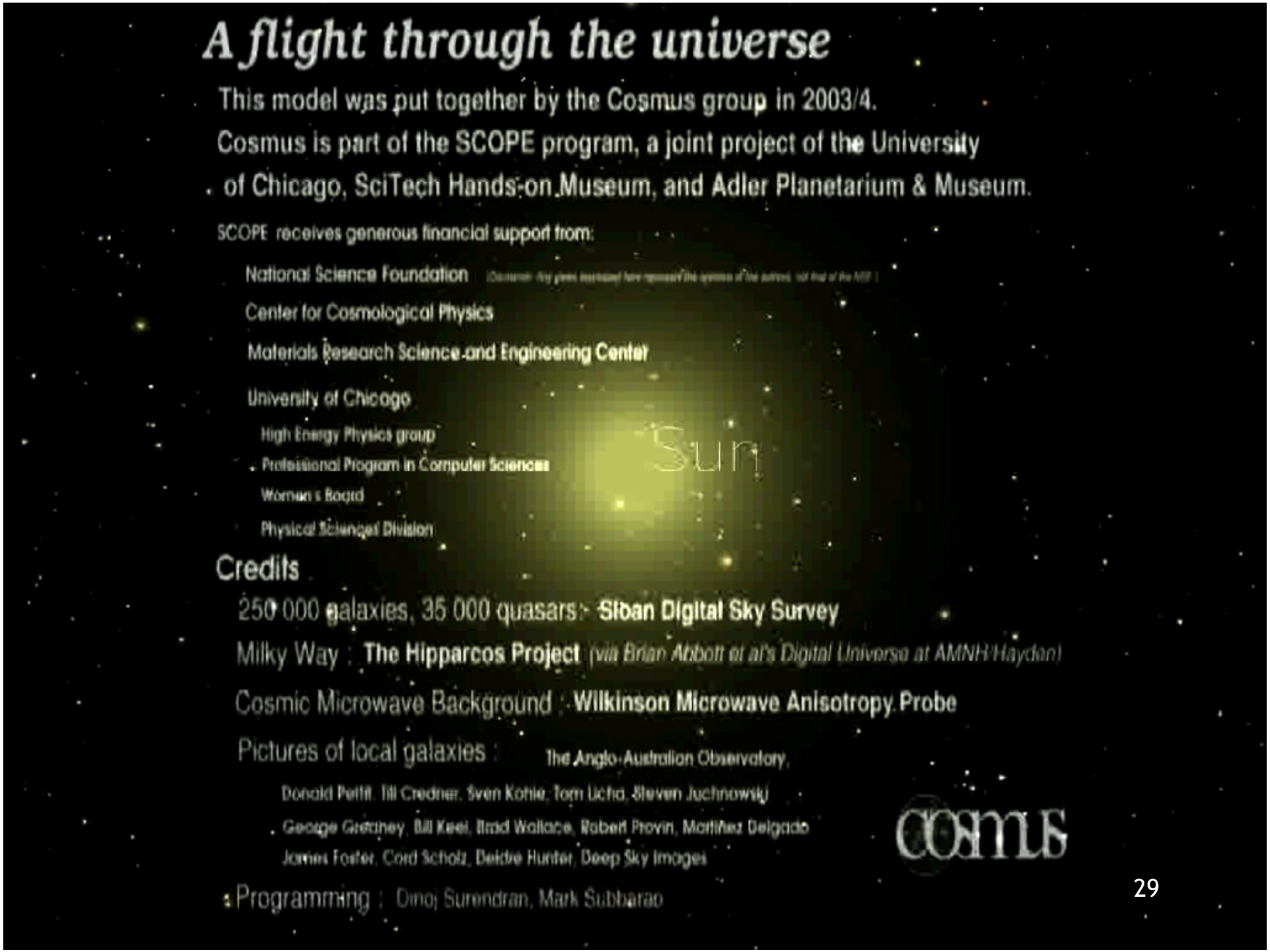
La grande ère de découverte se dévoile

Gran Descubrimiento Época Unfolds ...



COBE DMR

WMAP & Planck


A flight through the universe
This model was put together by the Cosmus group in 2003/4.
Cosmus is part of the SCOPE program, a joint project of the University
of Chicago, SciTech Hands-on Museum, and Adler Planetarium & Museum.
SCOPE receives generous financial support from:
National Science Foundation
Center for Cosmological Physics
Materials Research Science and Engineering Center
University of Chicago
High Energy Physics group
Professional Program in Computer Sciences
Women's Board
Physical Sciences Division
Sun
Credits
250 000 galaxies, 35 000 quasars : Sloan Digital Sky Survey
Milky Way : The Hipparcos Project (via Brian Abbott et al's Digital Universe at AMNH/Hayden)
Cosmic Microwave Background : Wilkinson Microwave Anisotropy Probe
Pictures of local galaxies : The Anglo-Australian Observatory,
Donald Pettit, Till Credner, Sven Kohle, Tom Licha, Steven Juchnowski
George Gretzney, Bill Keel, Brad Wallace, Robert Provin, Matthew Delgado
James Foster, Cord Scholz, Deidre Hunter, Deep Sky Images
Programming : Dinoj Surendran, Mark Subbarao
cosmus