Koinotda Materiyaning Yangi Formalari: Qorong'i Energiya va Qorong'i Modda

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Mundarija

1 Kirish

Mundarija

1. Kirish
2. Koinotda qorong'i materiya

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3. Koinotda qorong'i energiya

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4. Xulosa

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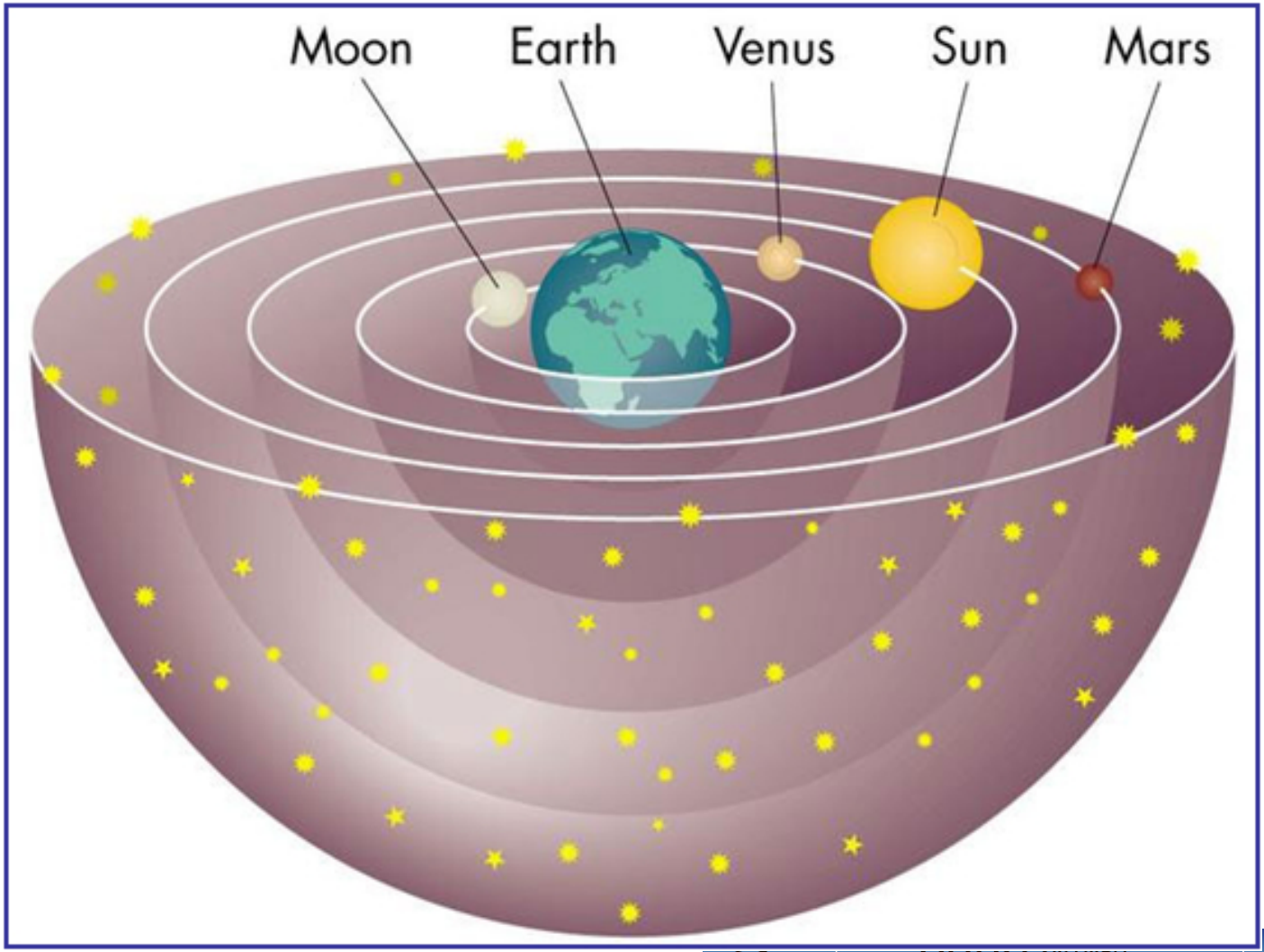
Kirish

- 2007 yil kuzida UNESCO 2009 yilni Astronomiya yili deb e'lon qildi va bu bilan astronomiyaning inson sivilizatsiyasidagi muhim ahamiyatga ega ekanligini tan oldi
- Bugungi kun astronomiyasi olimlar oldiga yangi va yangi chaqiruvlar bermoqda. Yaqinda Koinotda tabiati mutlaqo no'malum bo'lgan materiyaning yangi formalari topildi. Ularning (Qorong'i Energiya va Qorong'i Modda) Koinotdagi tarkibi asosiy bo'lib 96 foizni tashkil qiladi
- Bizlarga ma'lum bo'lgan materiyaning barion formasi (atomlar va molekulalar) - yulduzlar, planetalar, odamlarning tarkibiy qismi - Borliqning atigi 4 foizini tashkil etadi
- Astronomiyaning bugungi kun yutuqlarining hisobiga olimlar - odamzodning atrofidagi hodisalarning bilmasligi qanday oqibatlarga - olib kelishi anglab olishdi. Bu fanning rivojlantirish uchun asosiy omildir

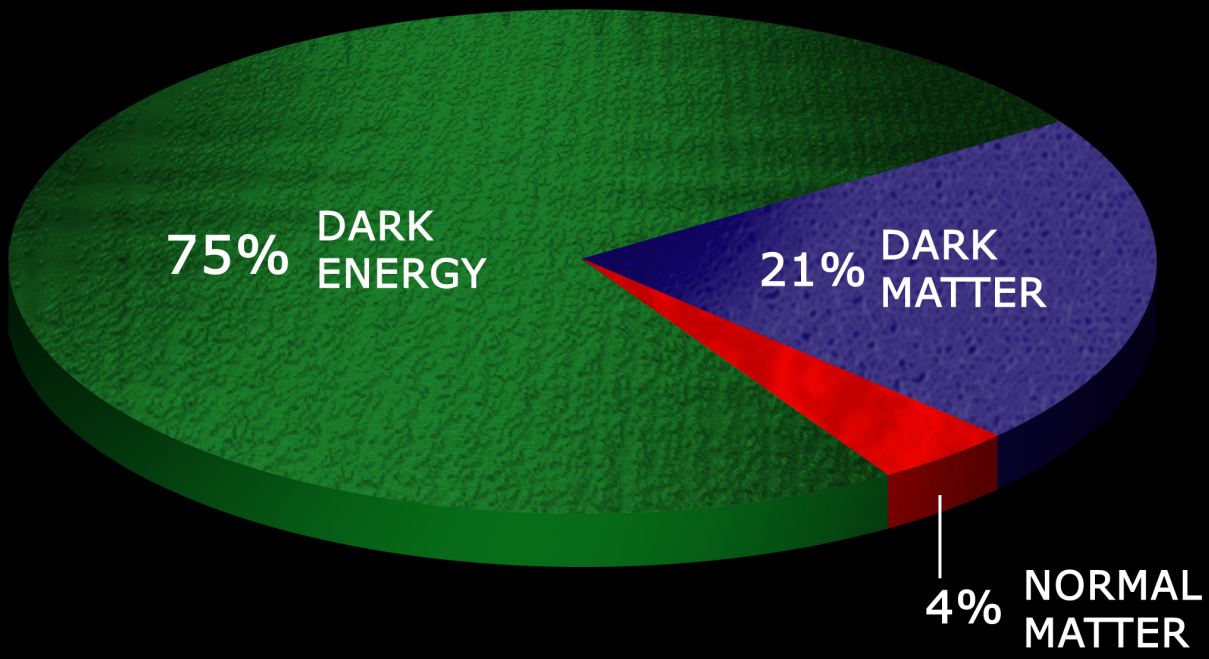
Kosmologiyadagi 3ta revolyutsia

- 2chi Asr: Claudius Ptolemy (Aristotle Fizikasi)
  Model: Markazda joylashgan Er-atrofidagi Kosmologiya
  Asosiy G'oya: Erda va Kosmosda qonuniyatlar o'xshamasligi
- 16chi Asr: Nicolaus Copernicus (Newton Fizikasi)
  Model: Markazda joylashgan Quyosh-atrofidagi Kosmologiya
  Asosiy G'oya: Universal fizika; qonuniyatlar hamma joyda bir xilligi
- 20chi Asr: Edwin Hubble (Einstein Fizikasi)
  Model: Buyuk Portlash Kosmologiyasi
  Asosiy G'oya: Koinot o'zgaruvchan va kengaymoqda

Koinotning tarkibi - Ptolemey bo'yicha



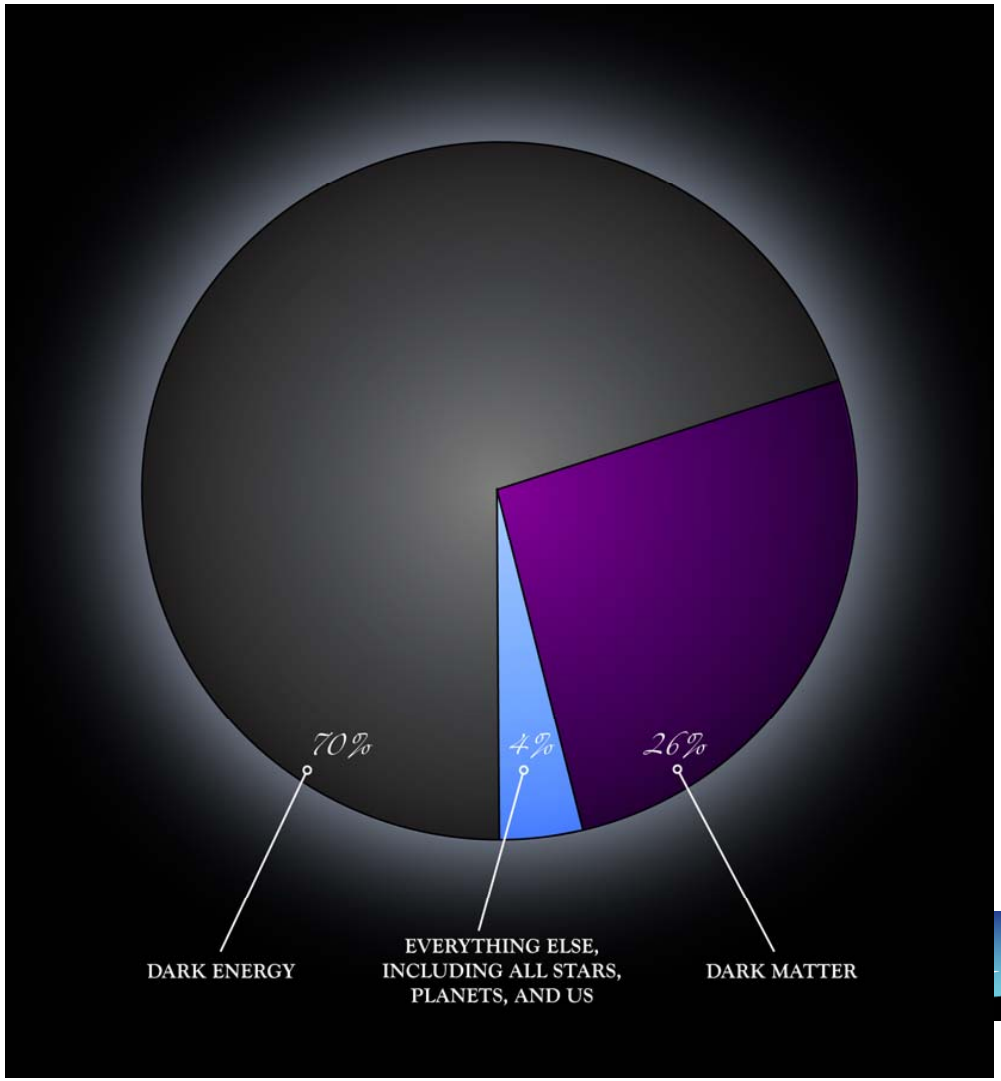
Koinotning hozirgi tarkibi



Koinotning hozirgi tarkibi

Chandra X-Ray Observatory

What the Universe is Made of



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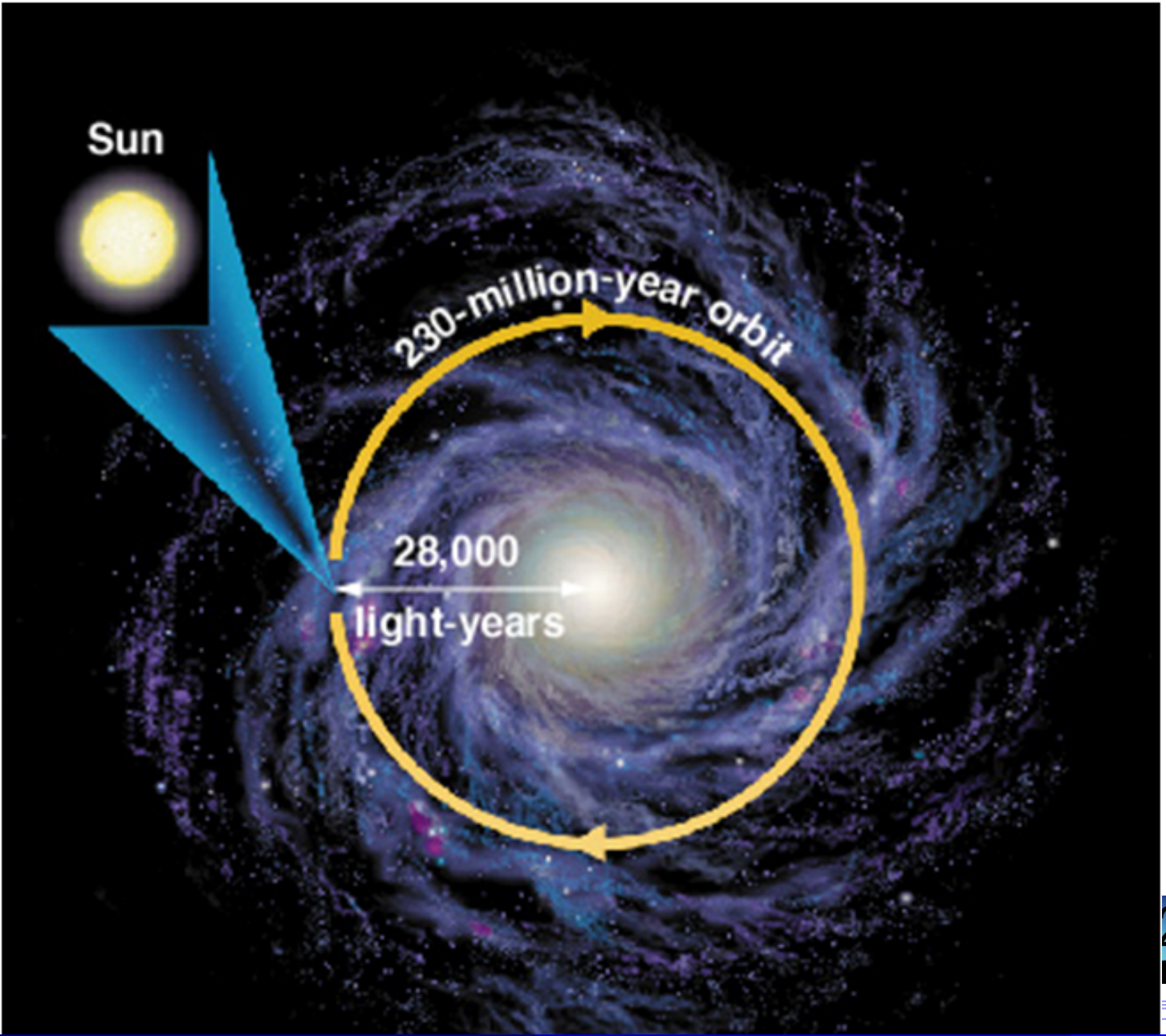
Koinotda qorong'i materiya

Koinotda qorong'i materiya

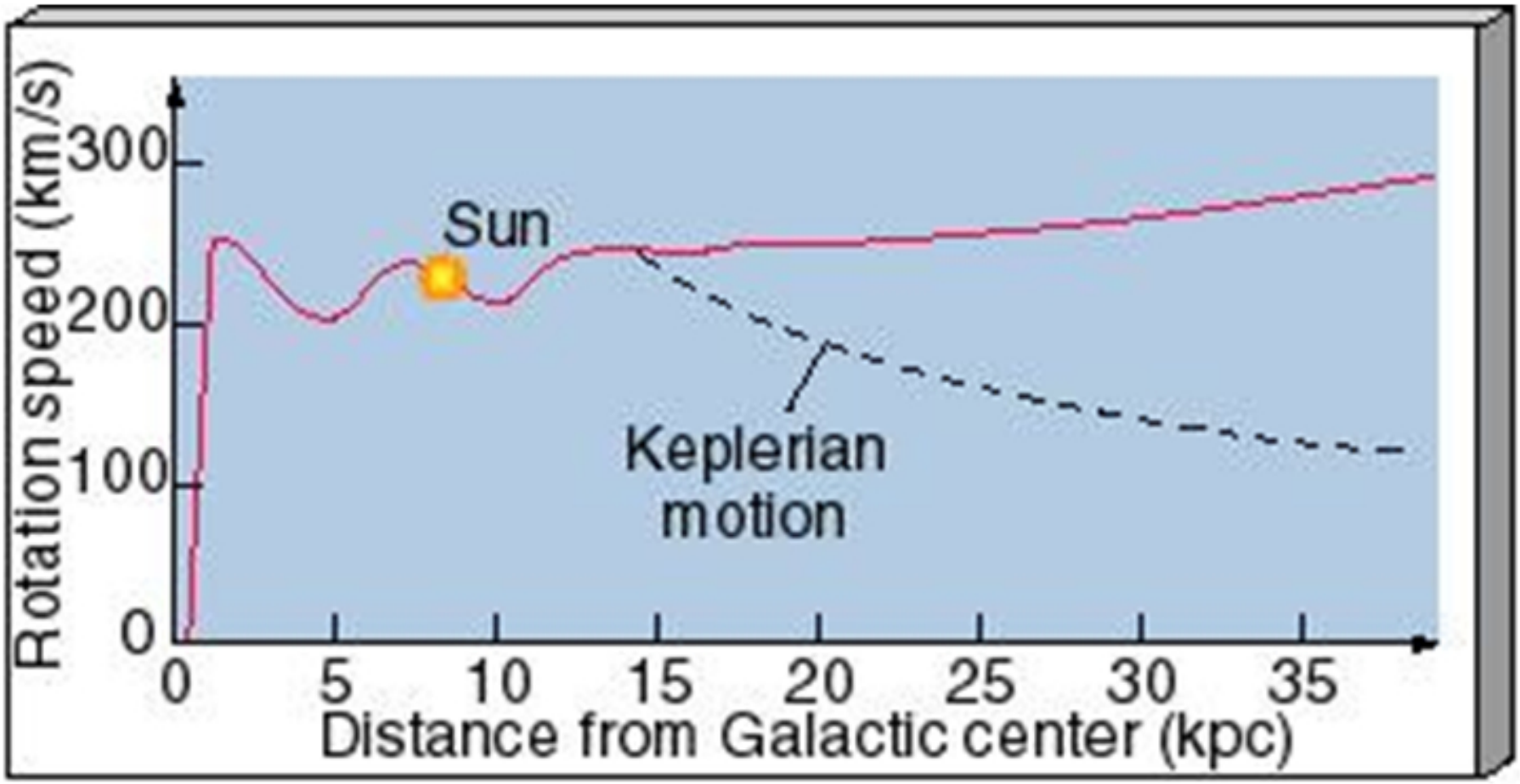
Quyosh Galaktikada



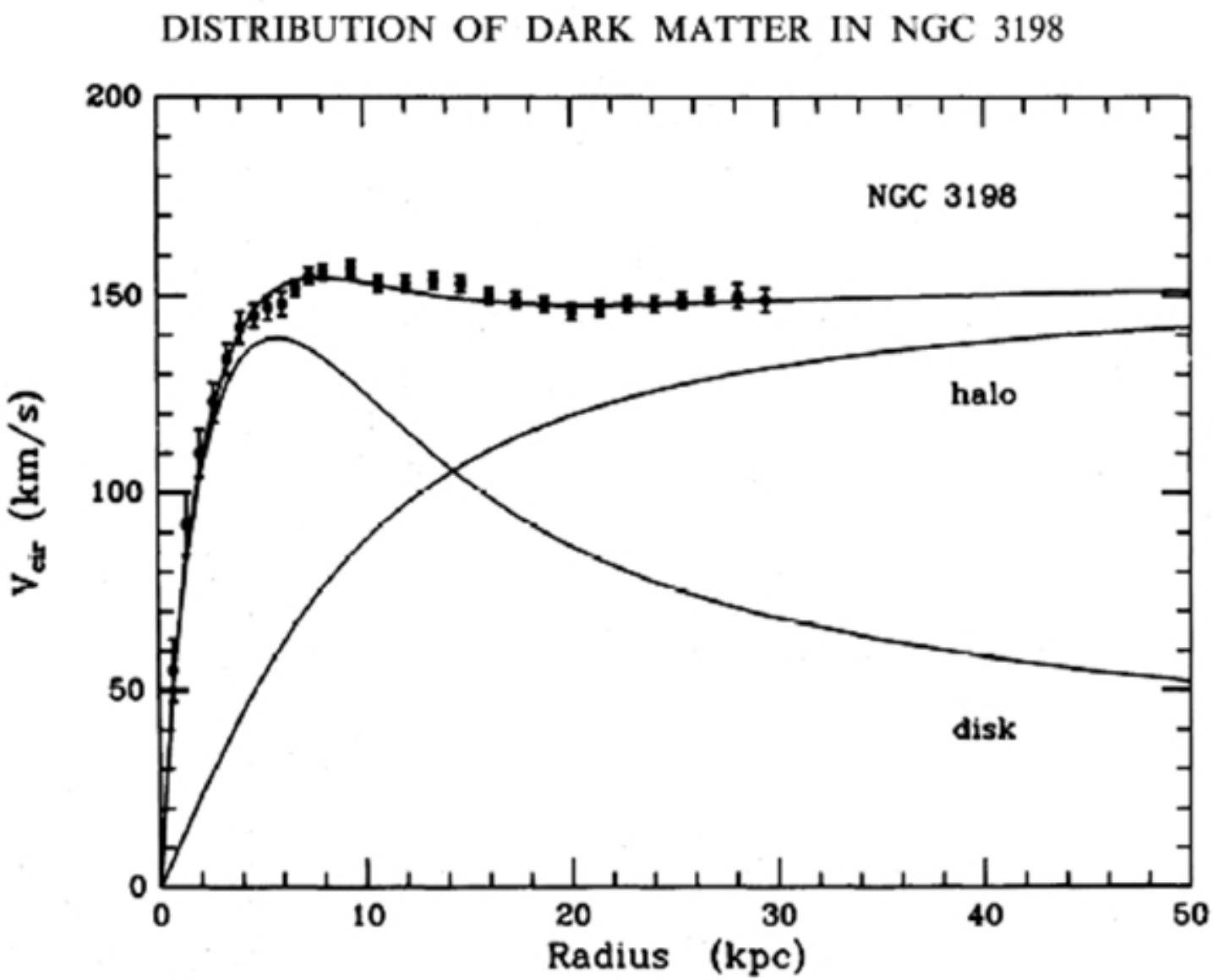
Koinotda qorong'i materiya

VERA RUBIN

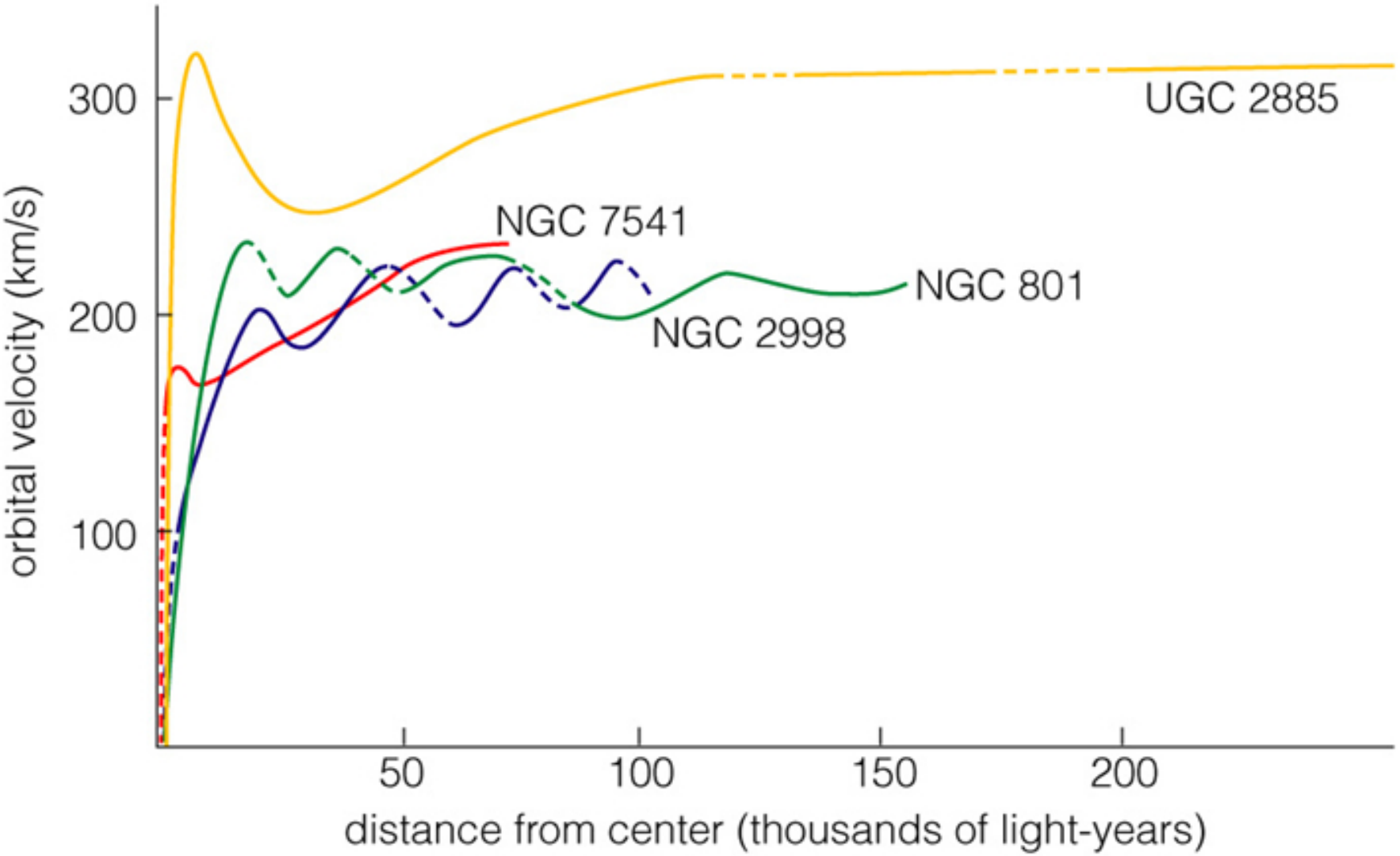
Koinotda qorong'i materiya



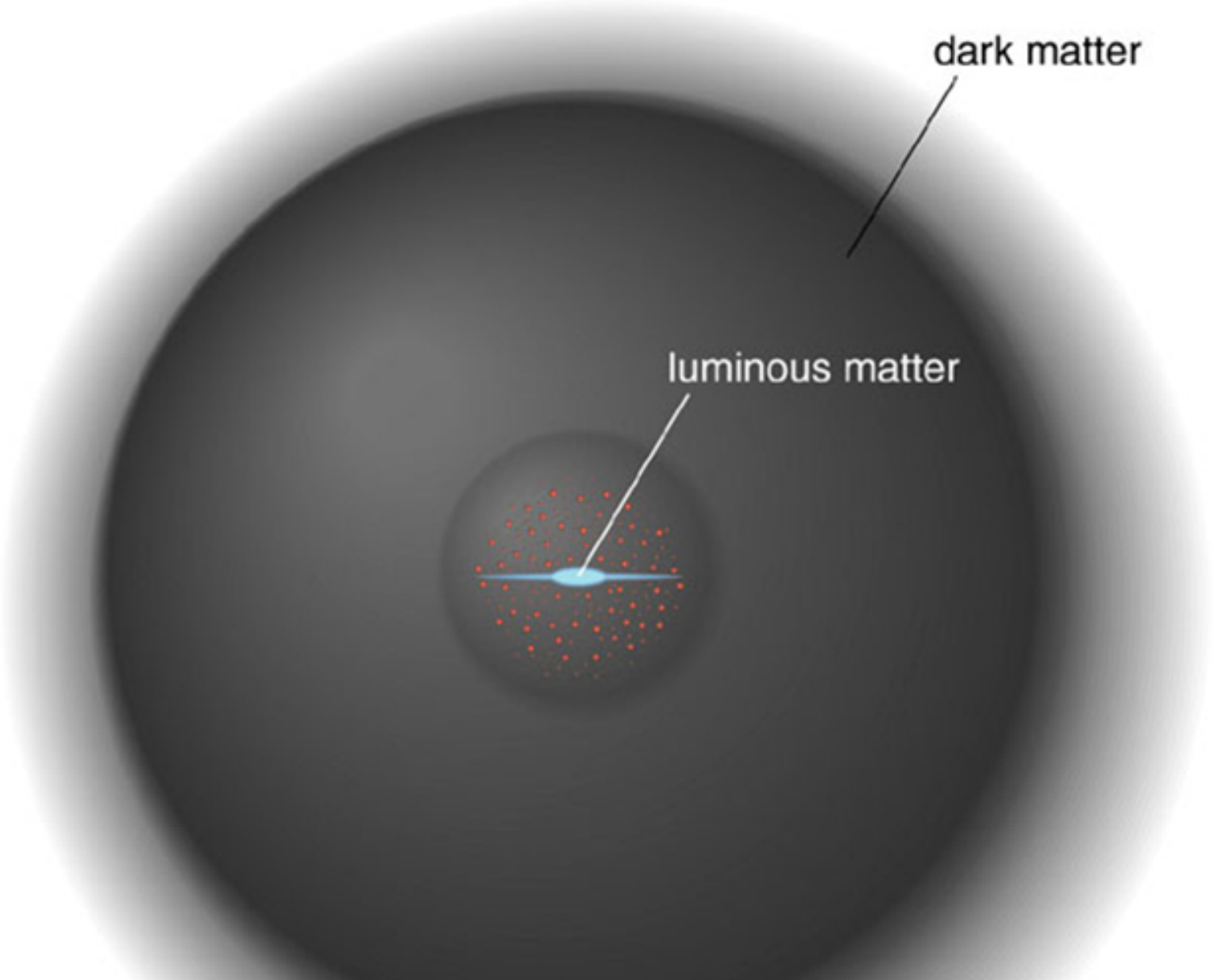
Koinotda qorong'i materiya



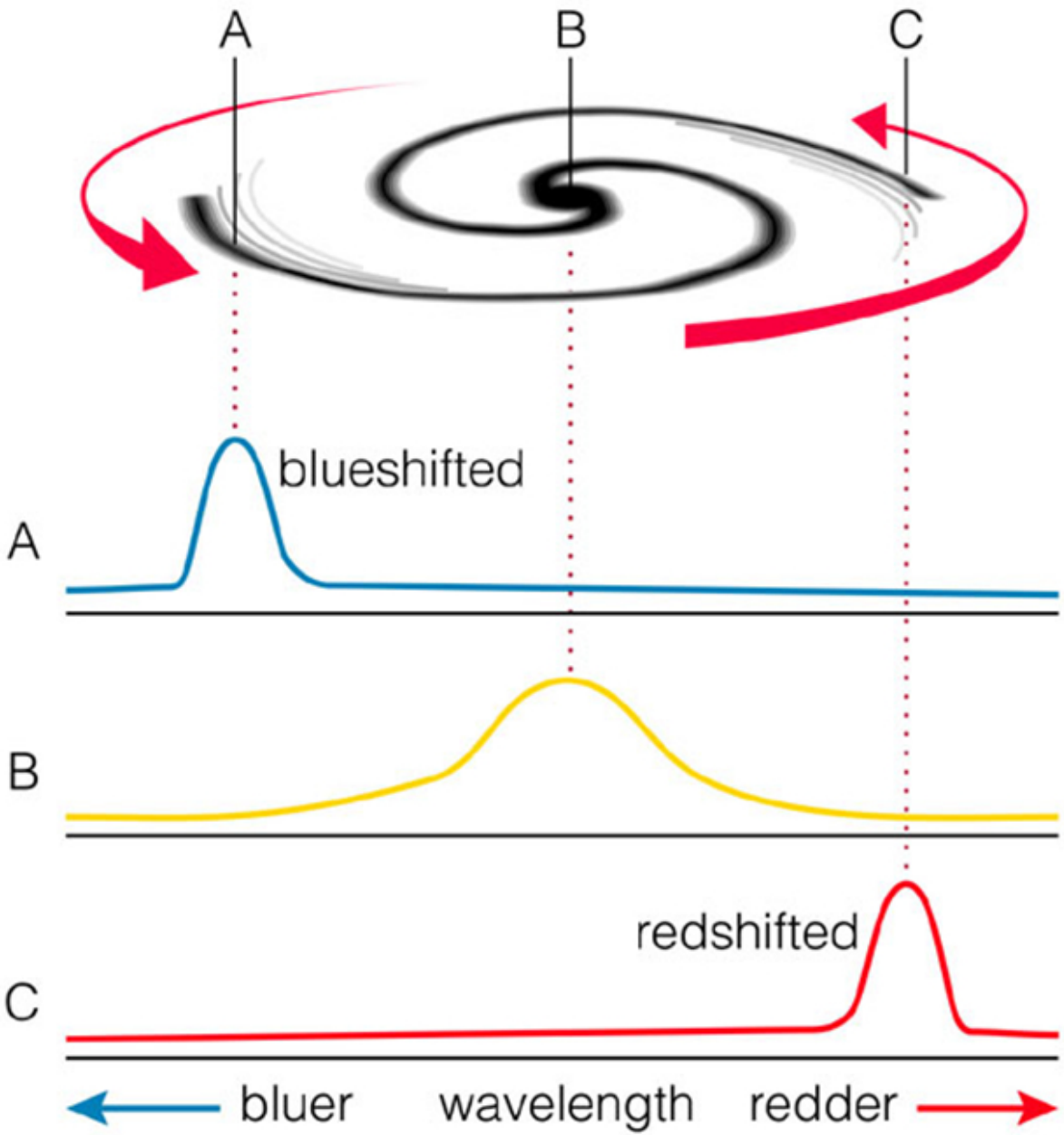
Koinotda qorong'i materiya



Koinotda qorong'i materiya

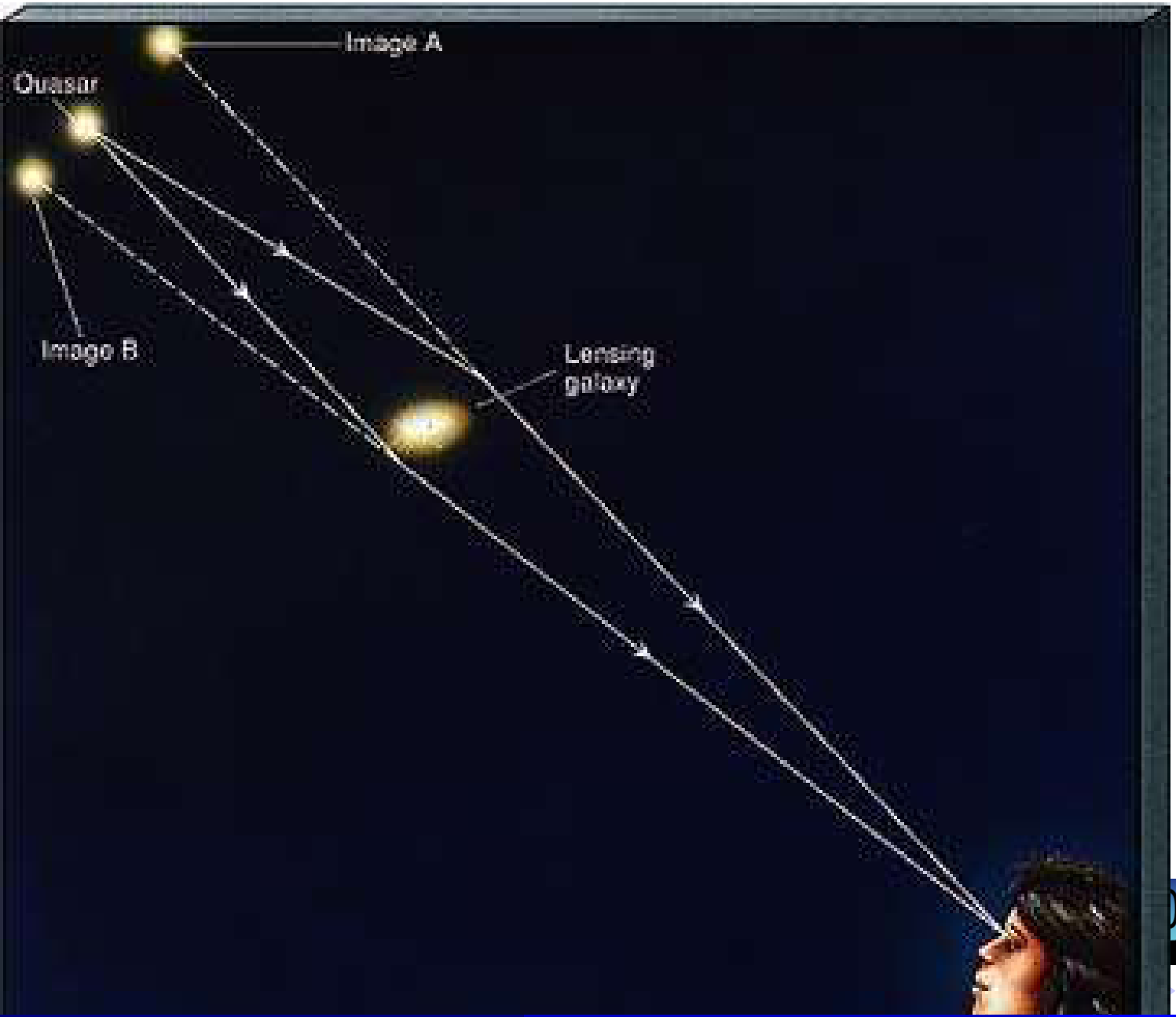


Galaktikalarda Yulduzlarning Tezliklarini O'lchash



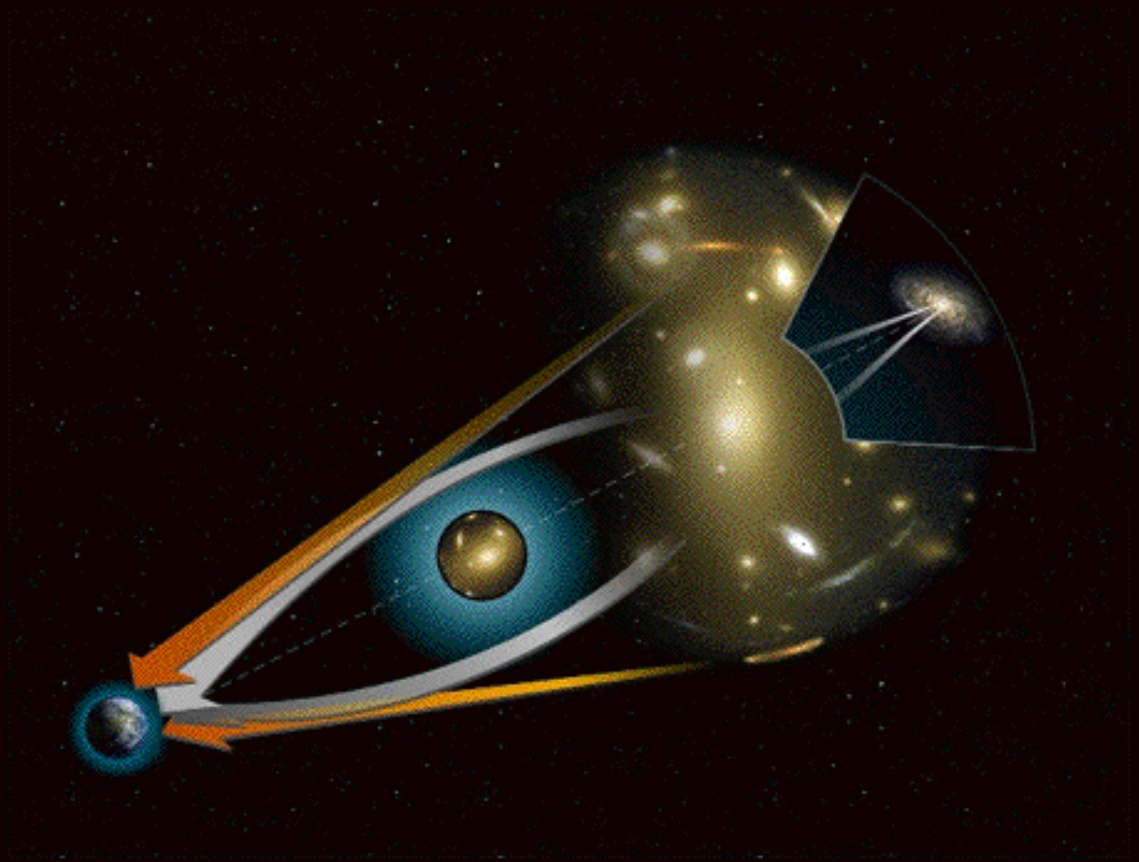
Gravitational Lensing

Gravitational Lensing



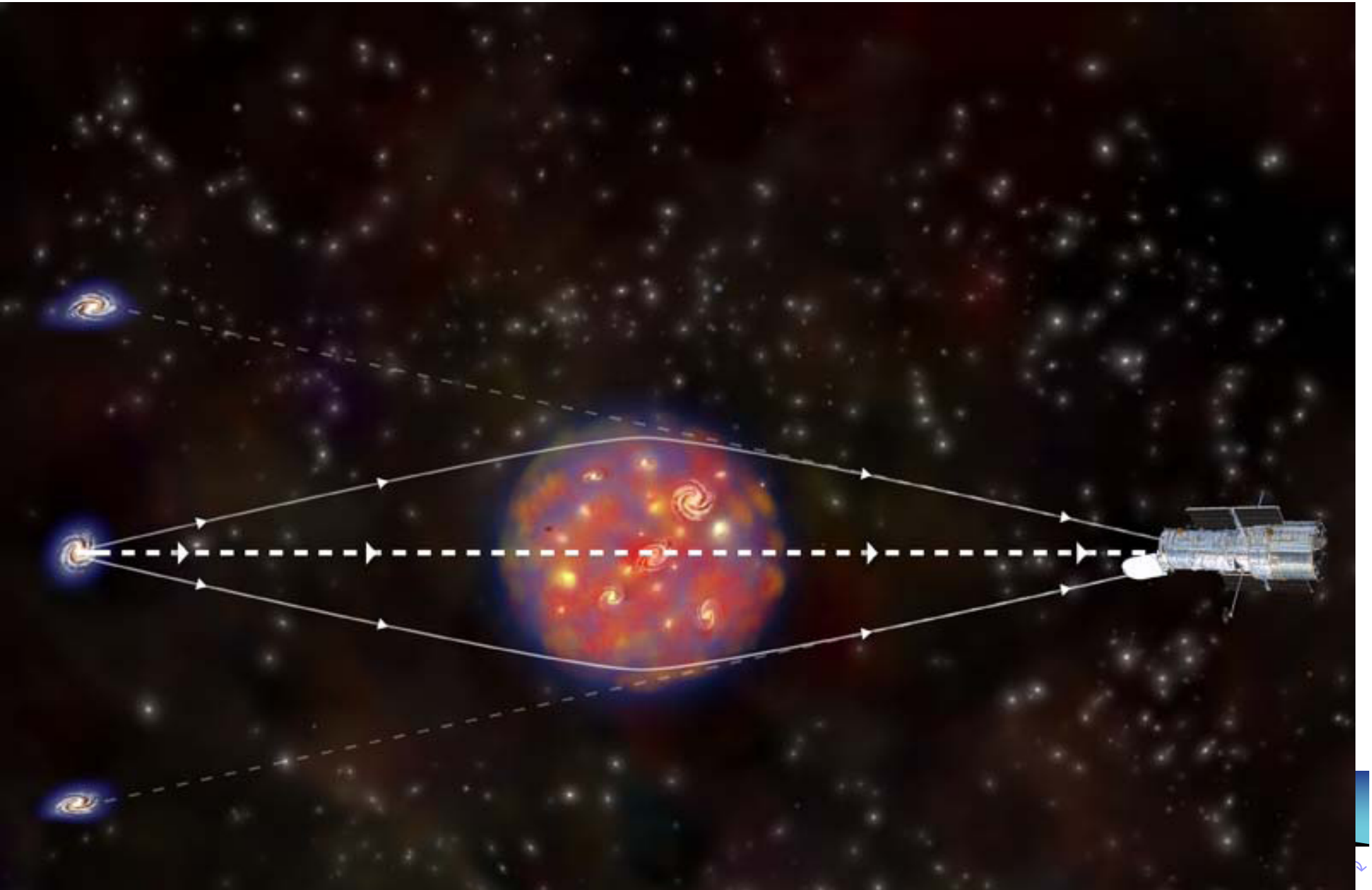
Gravitational Lensing

Is what we see all there is?

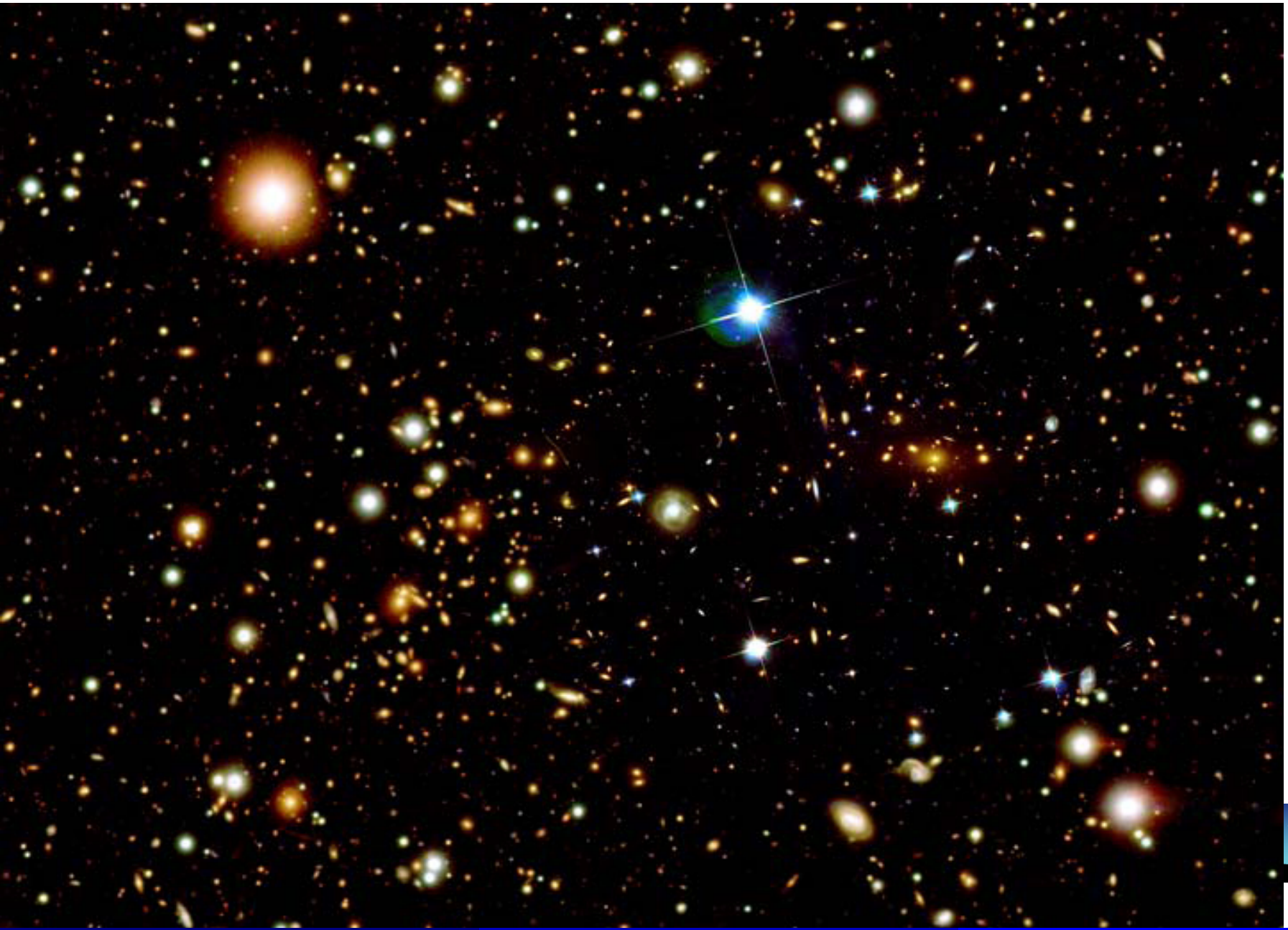


Einstein: all forms of matter and energy cause gravity, and are affected by gravity. By observing how light is deflected ("gravitational lensing"), we can detect gravitational fields, and *weigh the universe*.

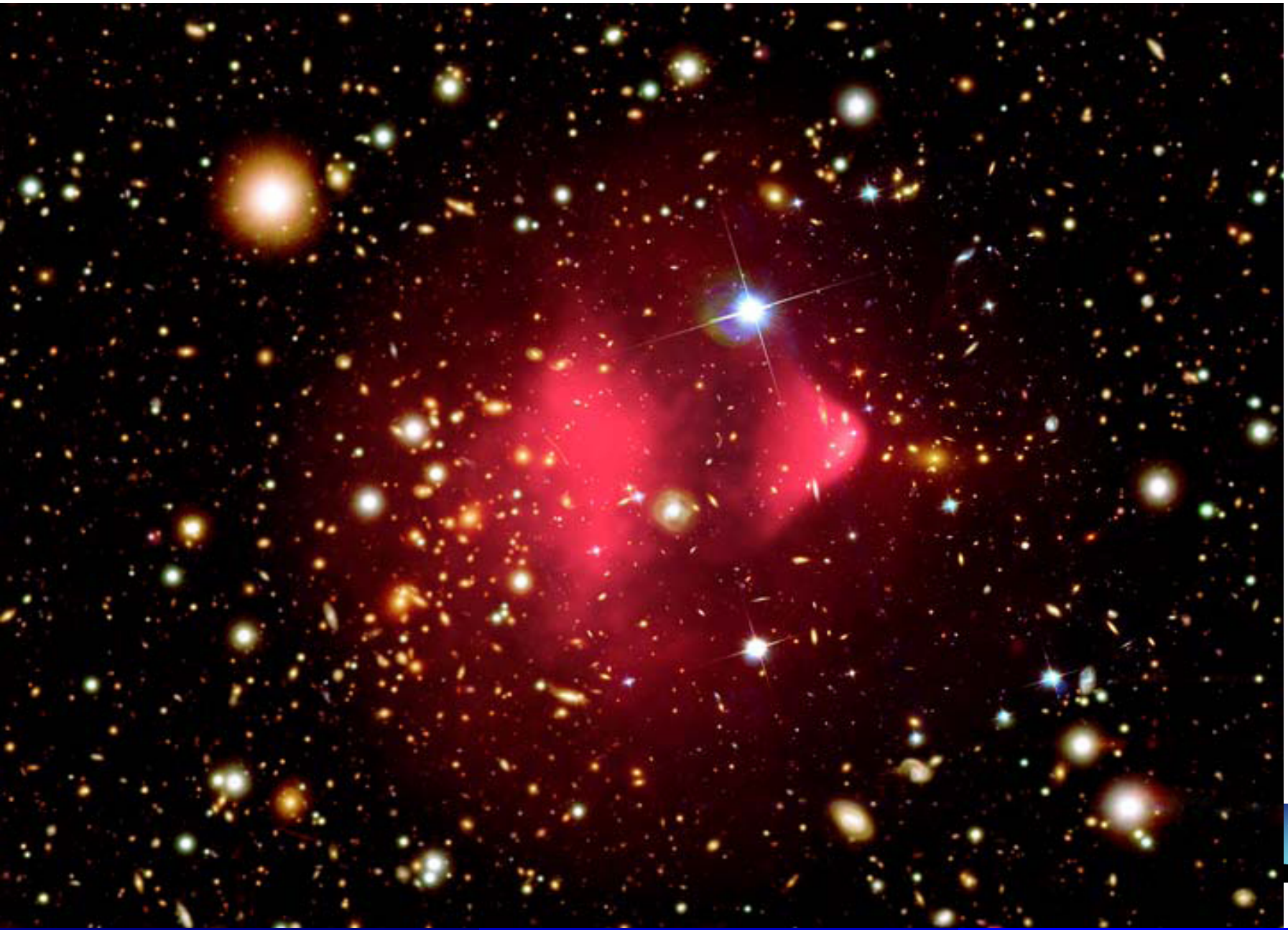
Koinotda qorong'i materiya



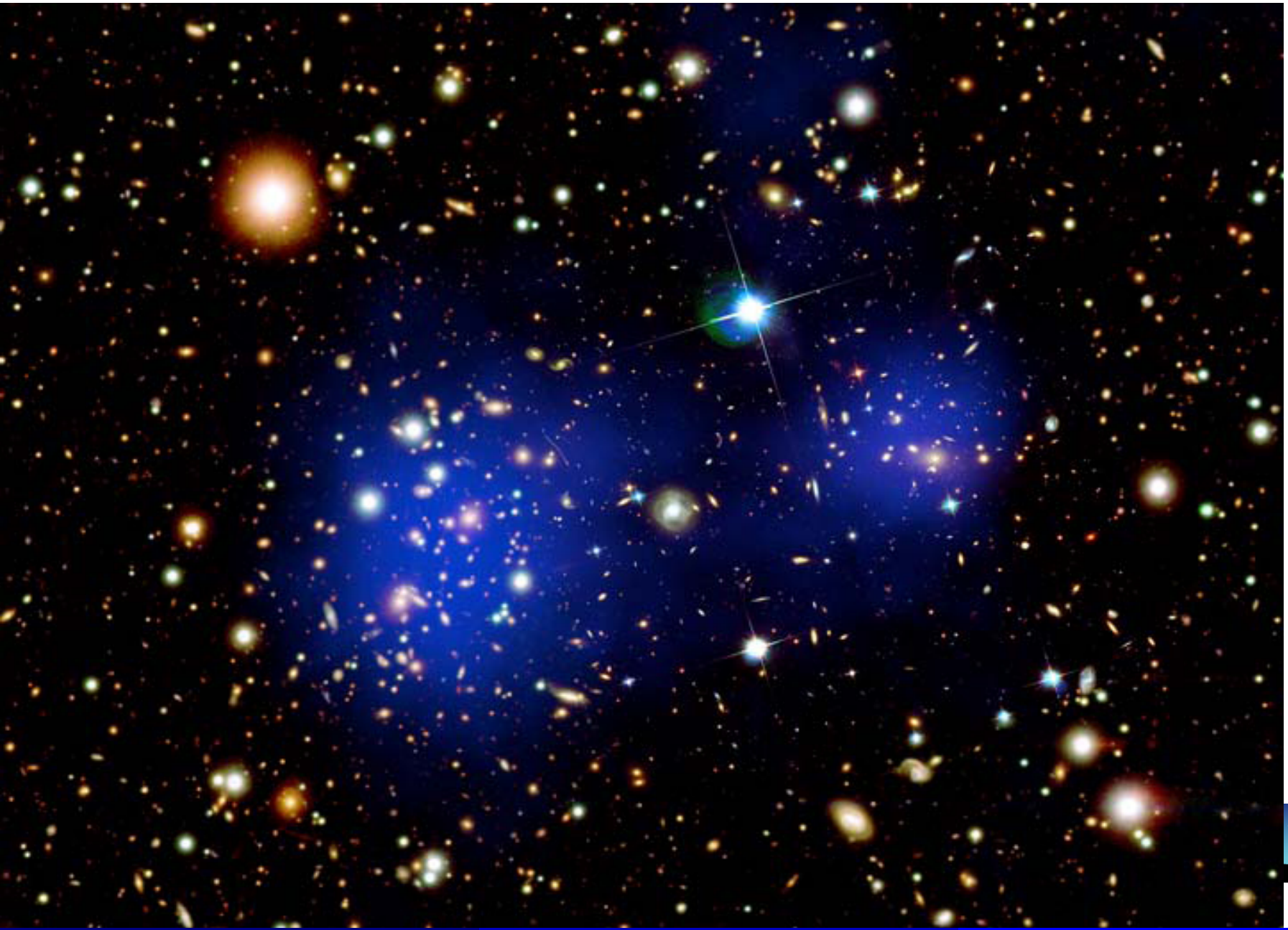
Bullet Cluster (optical)



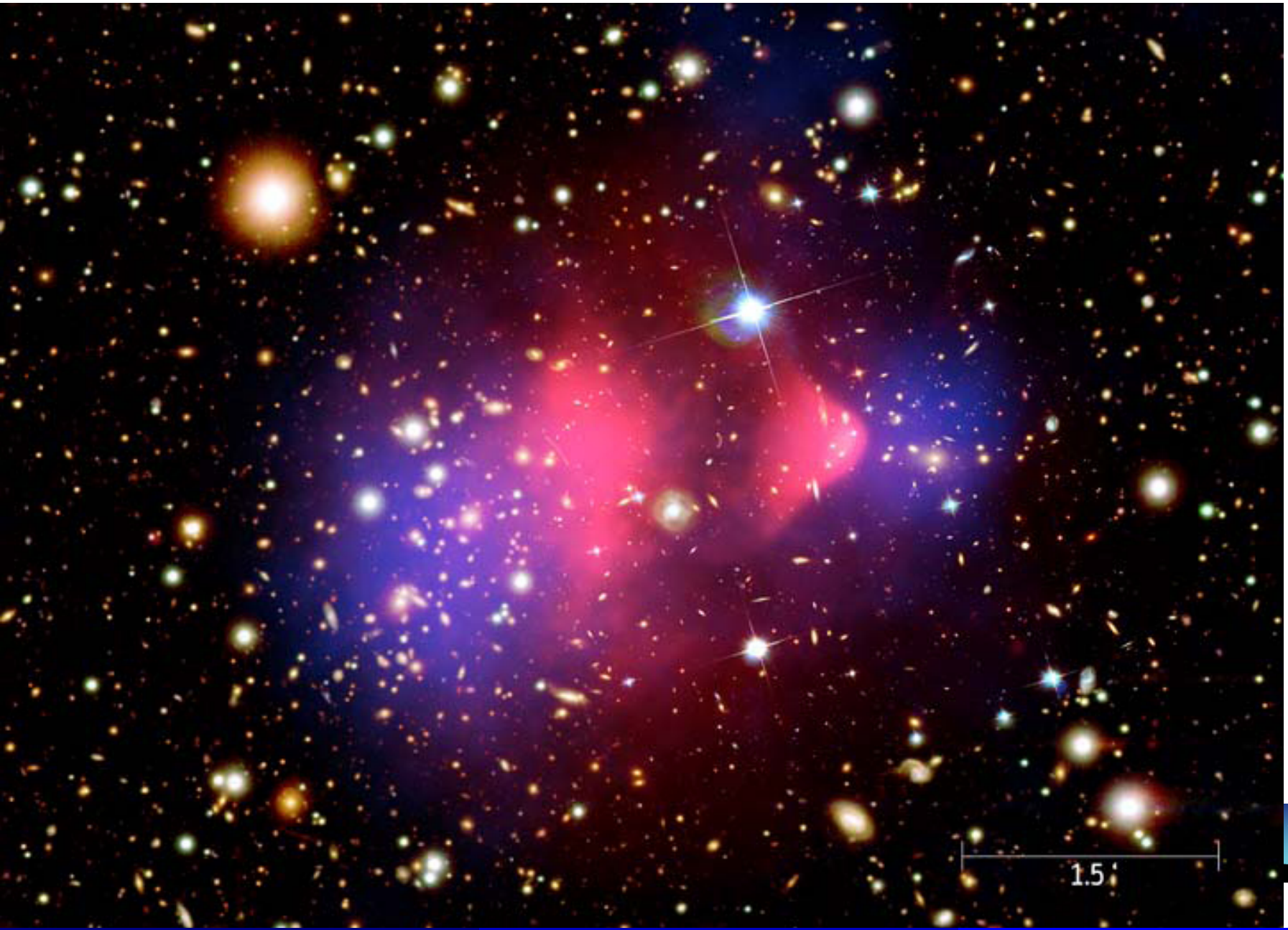
Bullet Cluster (X-ray + optical)



Bullet Cluster (optical + lensing)

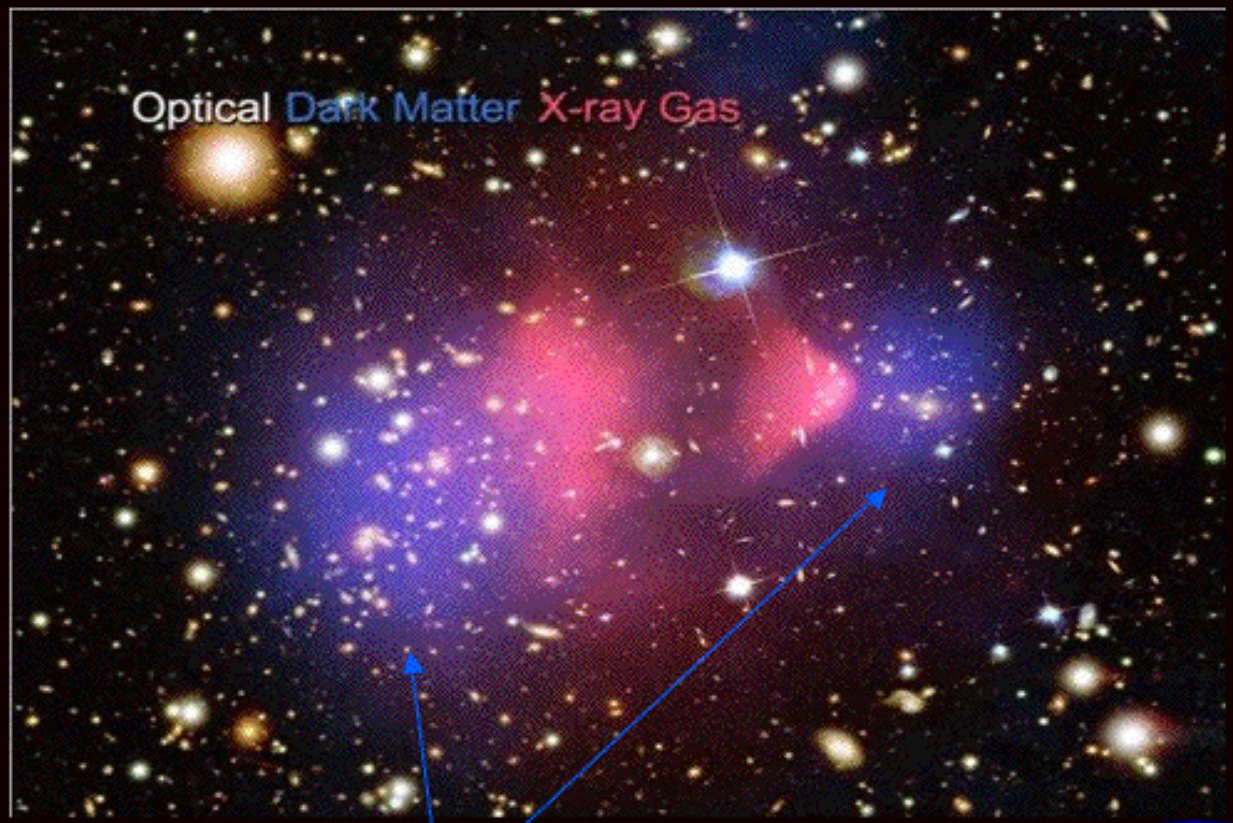


Bullet Cluster (all)

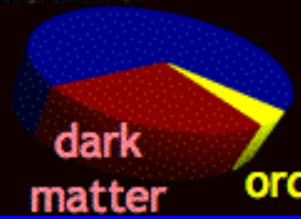


Bullet Cluster (all)

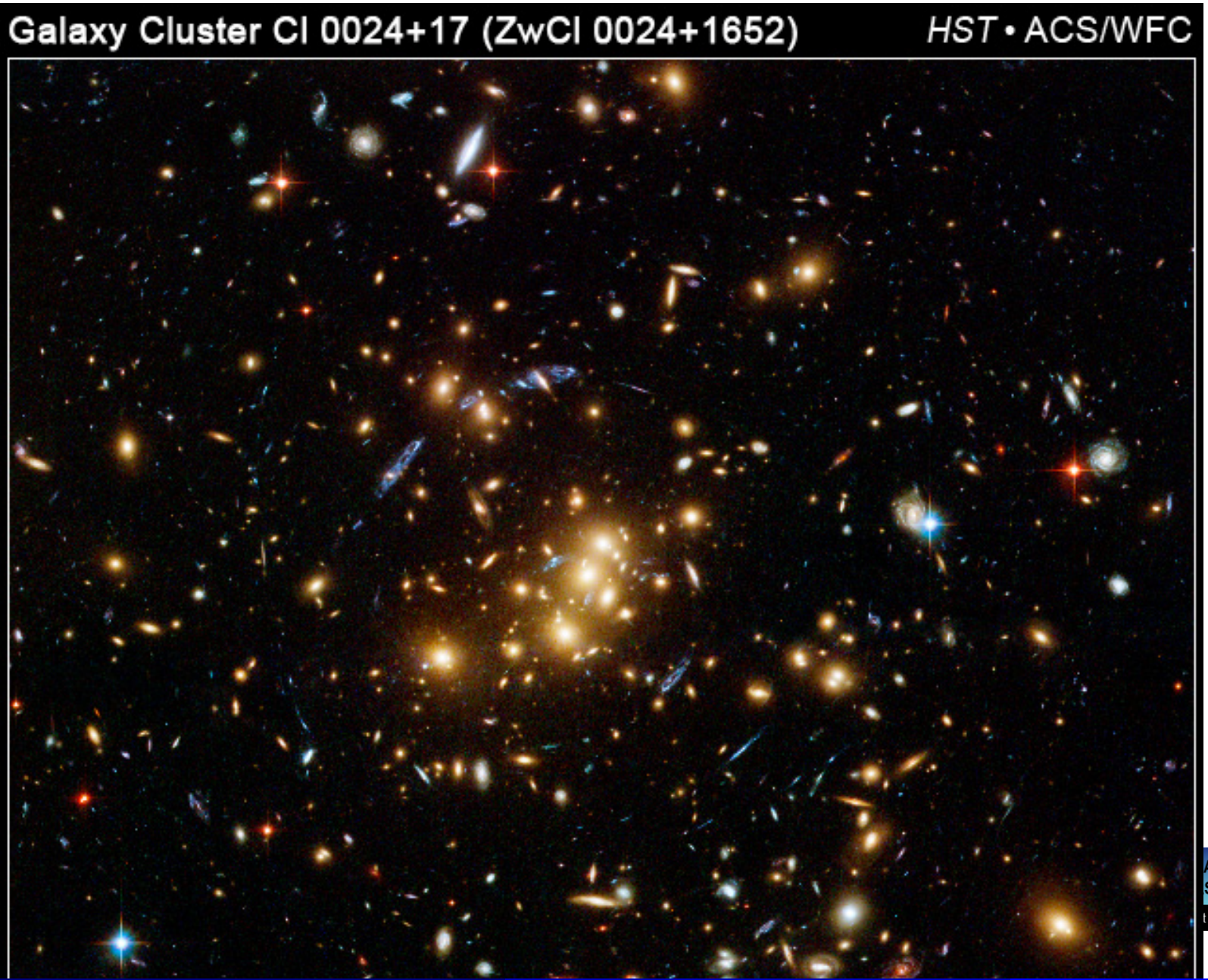
Bullet Cluster



gravitational field is centered on a different source than the ordinary matter -- dark matter



Galaxy Cluster



Galaxy Cluster

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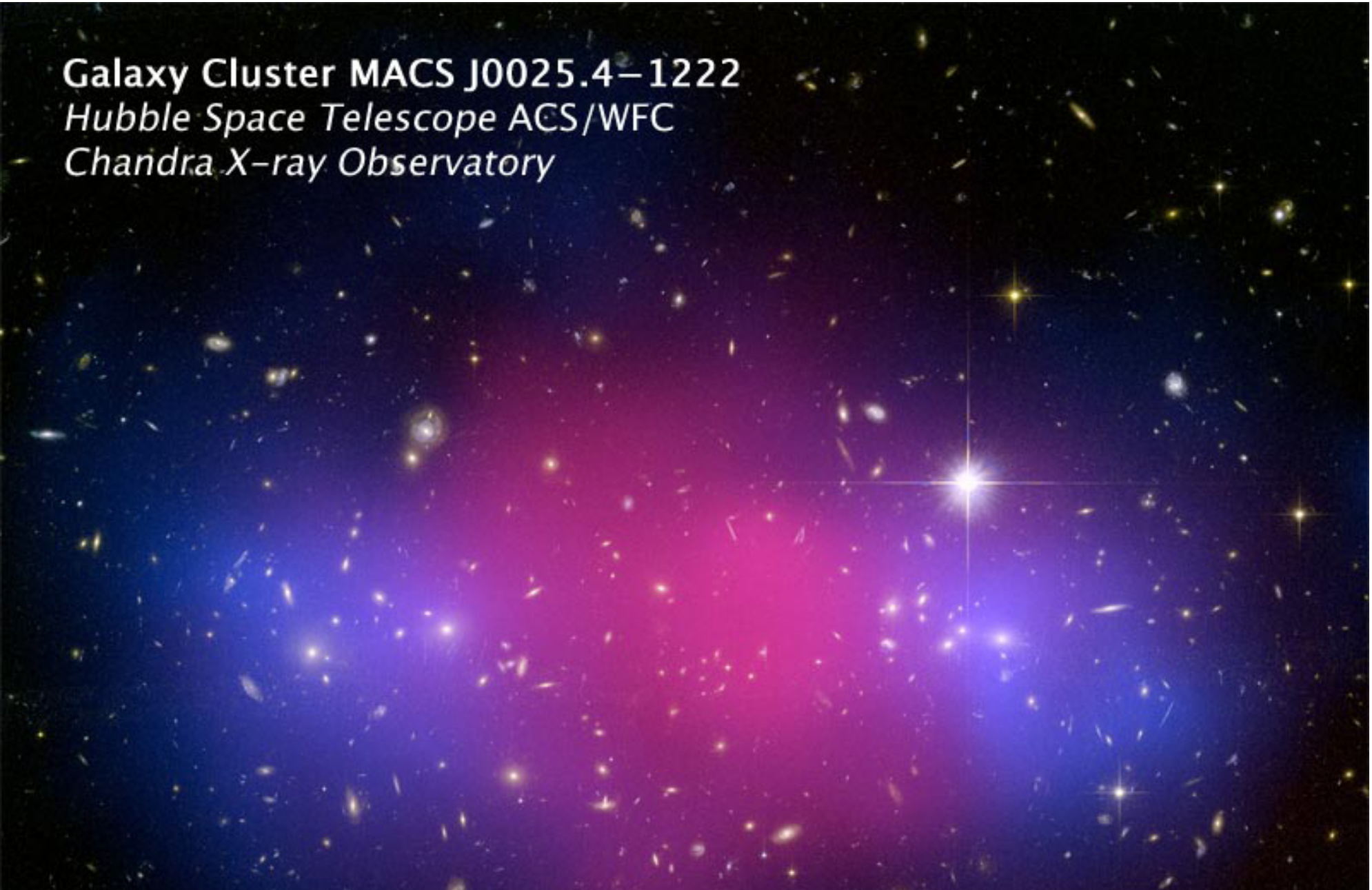

Koinotning kengayishi

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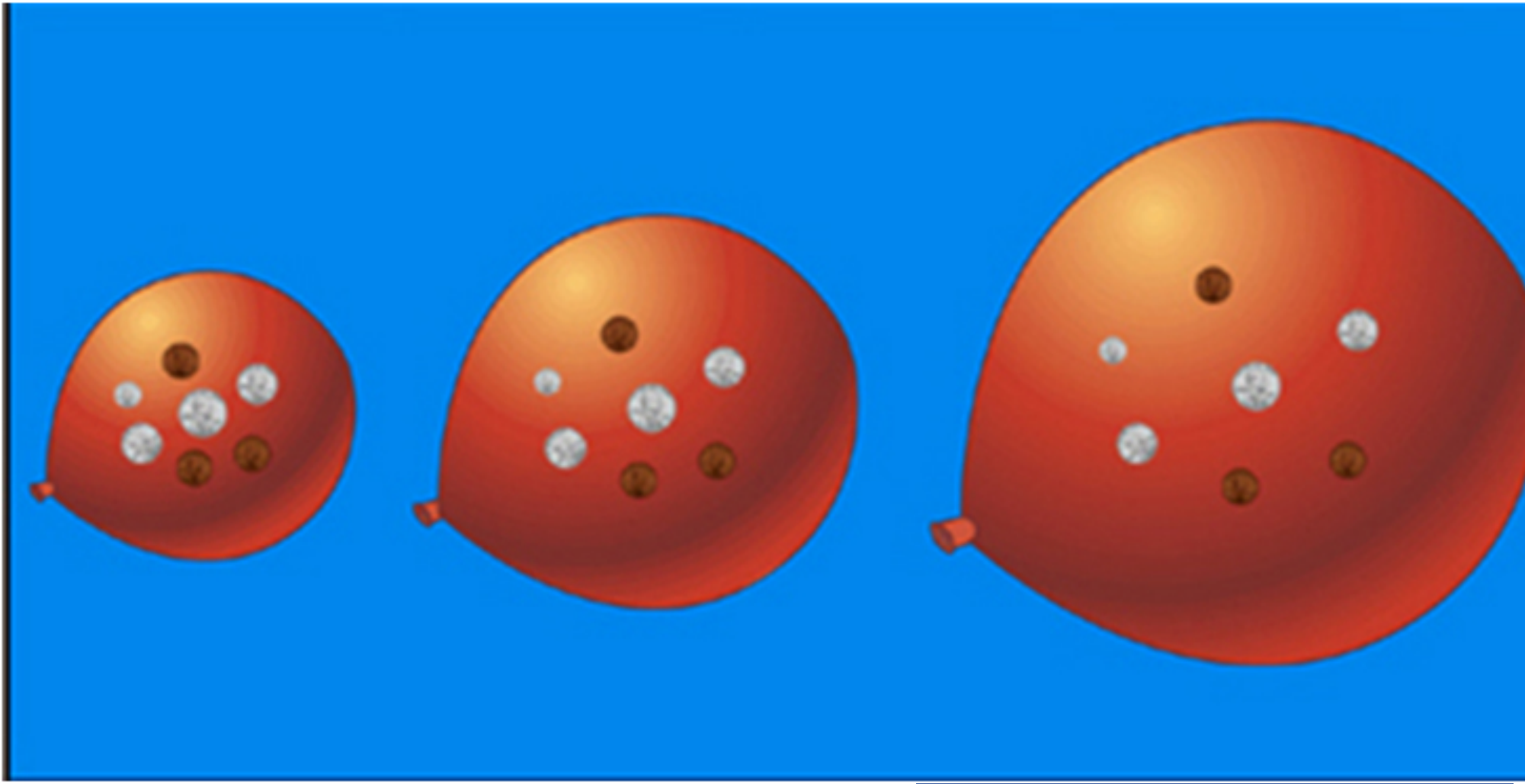
Einstein, Friedman and Hubble

- Einstein

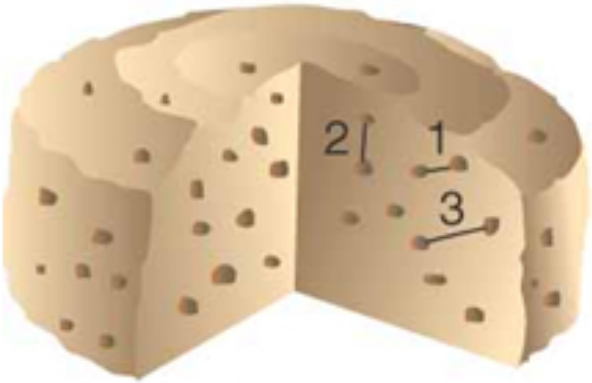
- Friedman

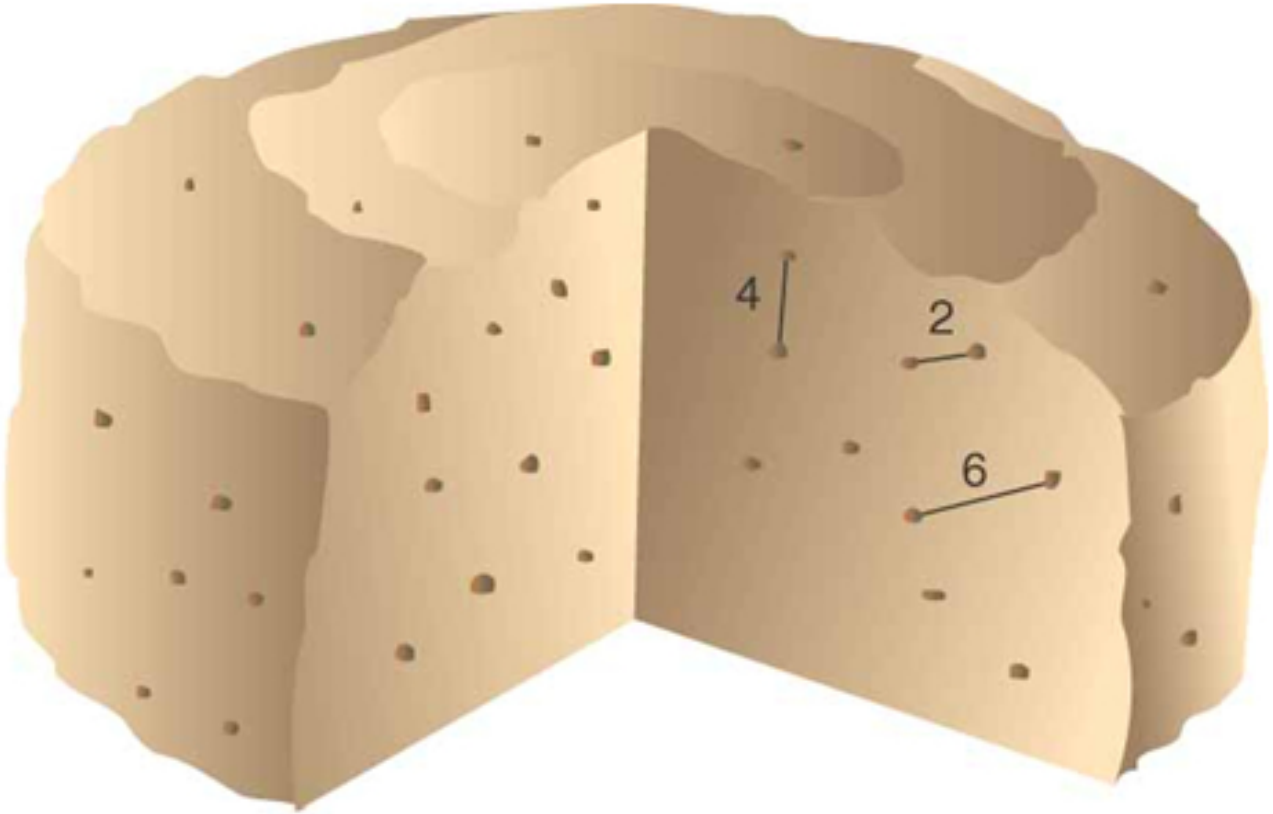
- Hubble

Koinotning kengayishi



Koinotning kengayishi





Koinotning kengayishi

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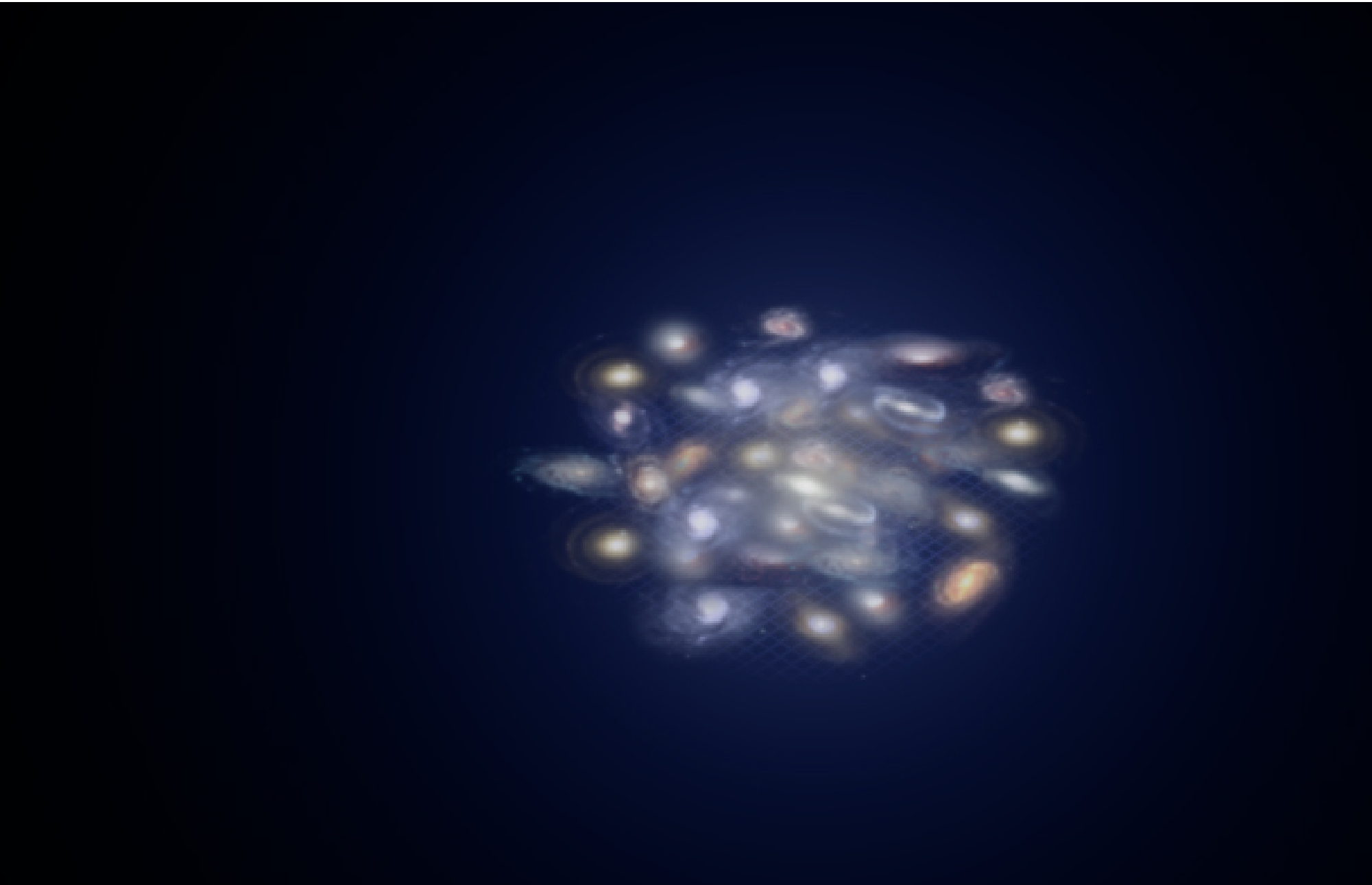

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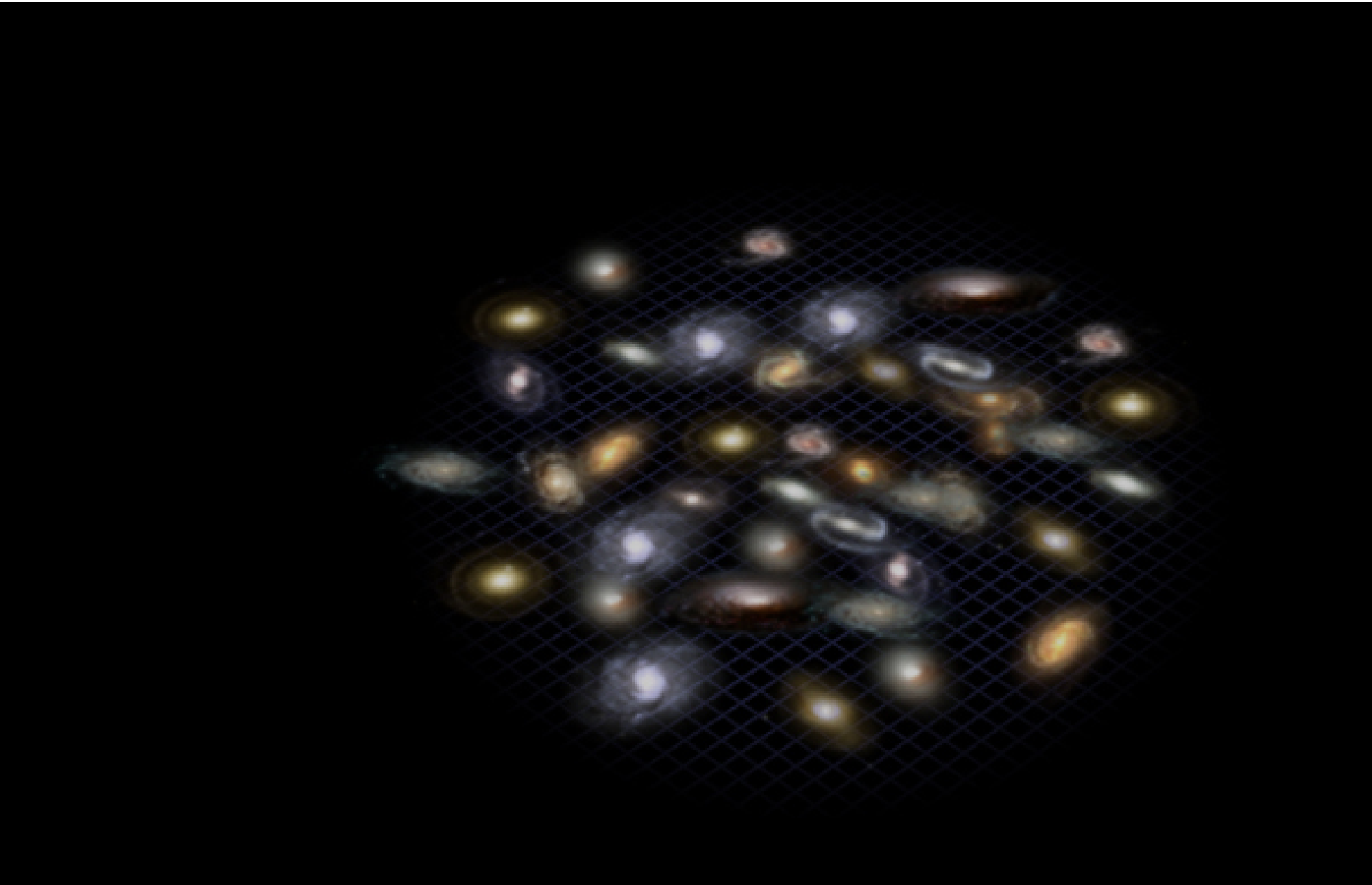

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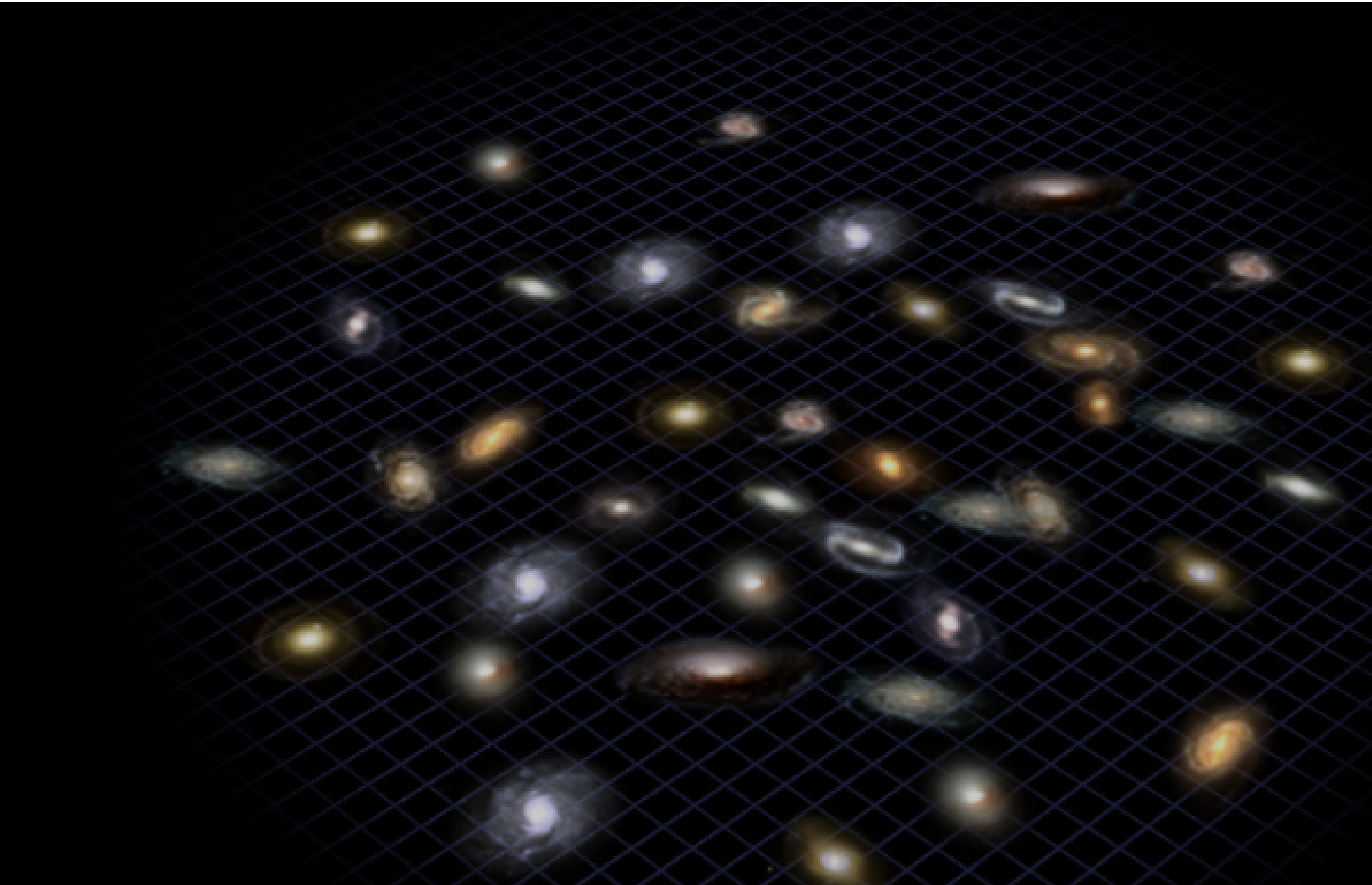

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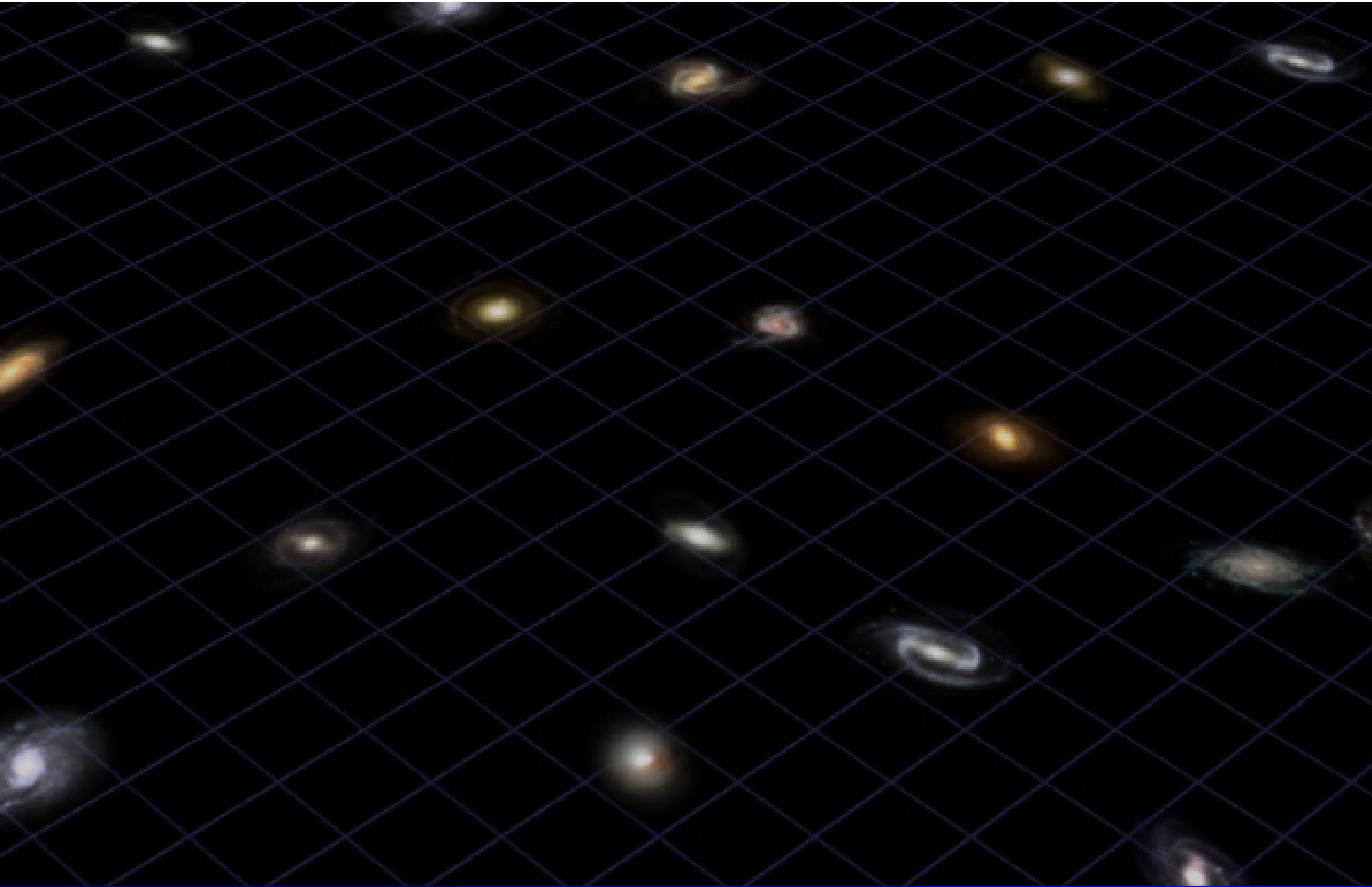

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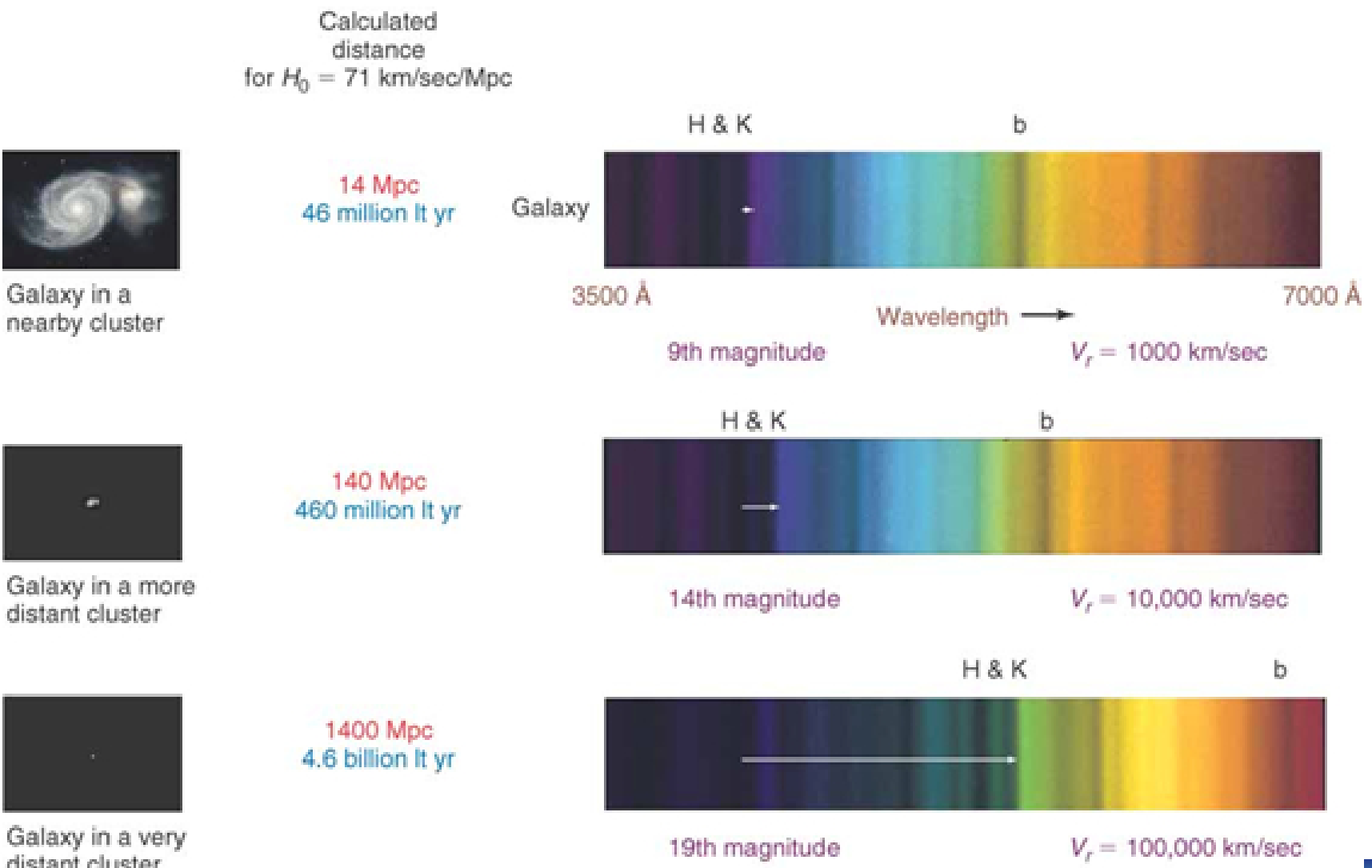
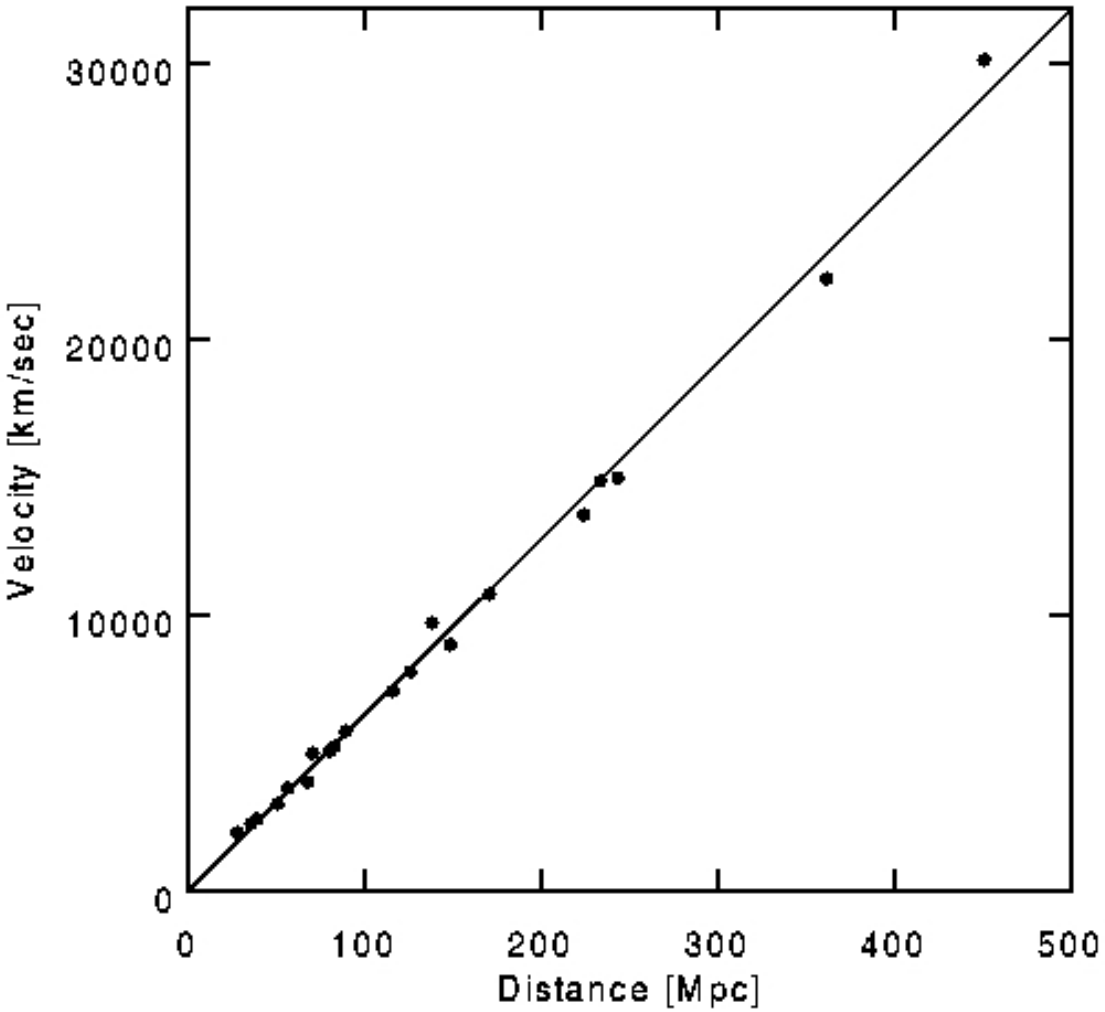


Koinotning kengayishi

Hubble qonuni

$$V = Hd$$



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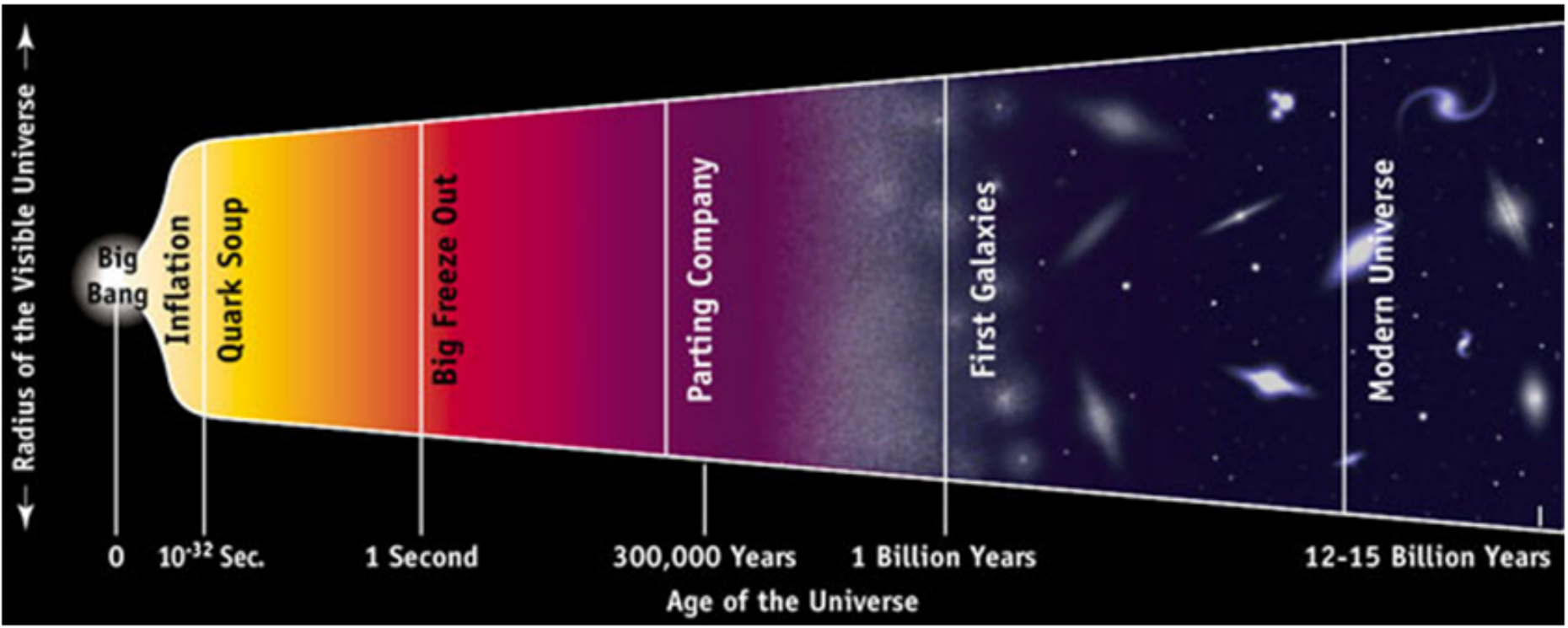

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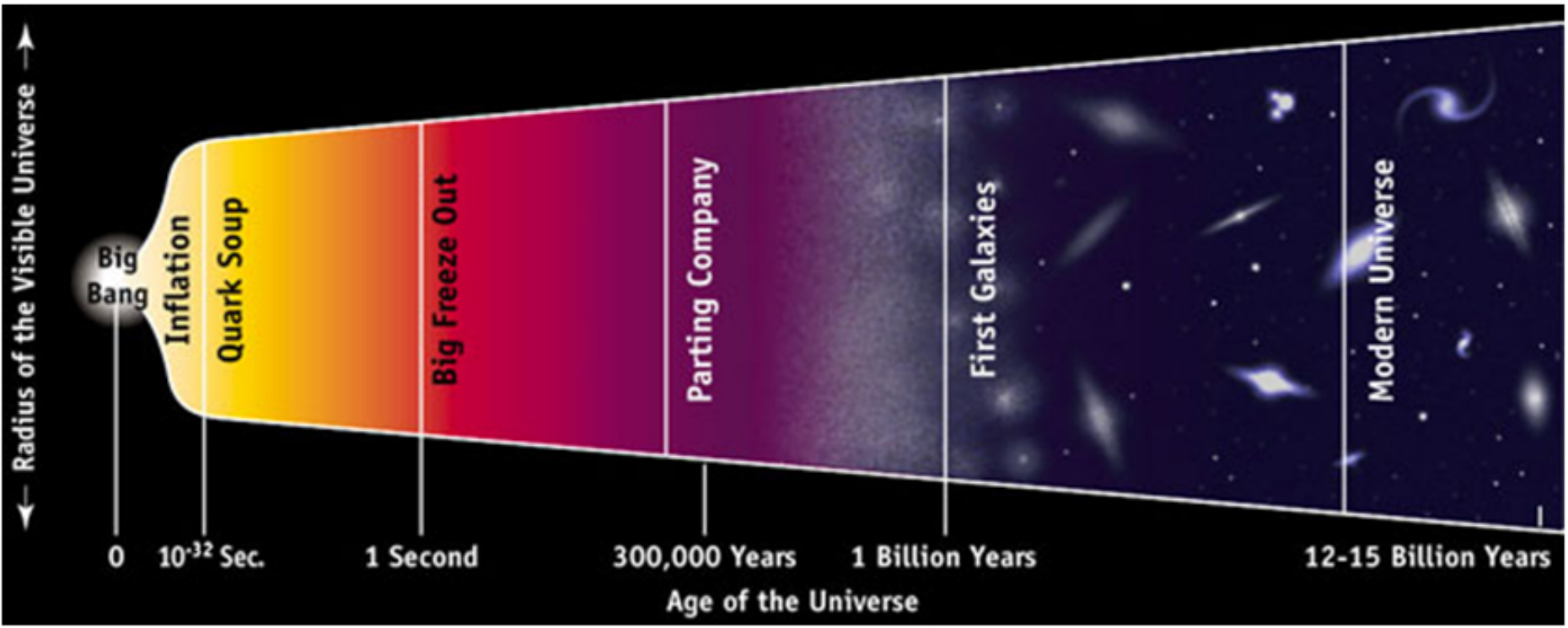

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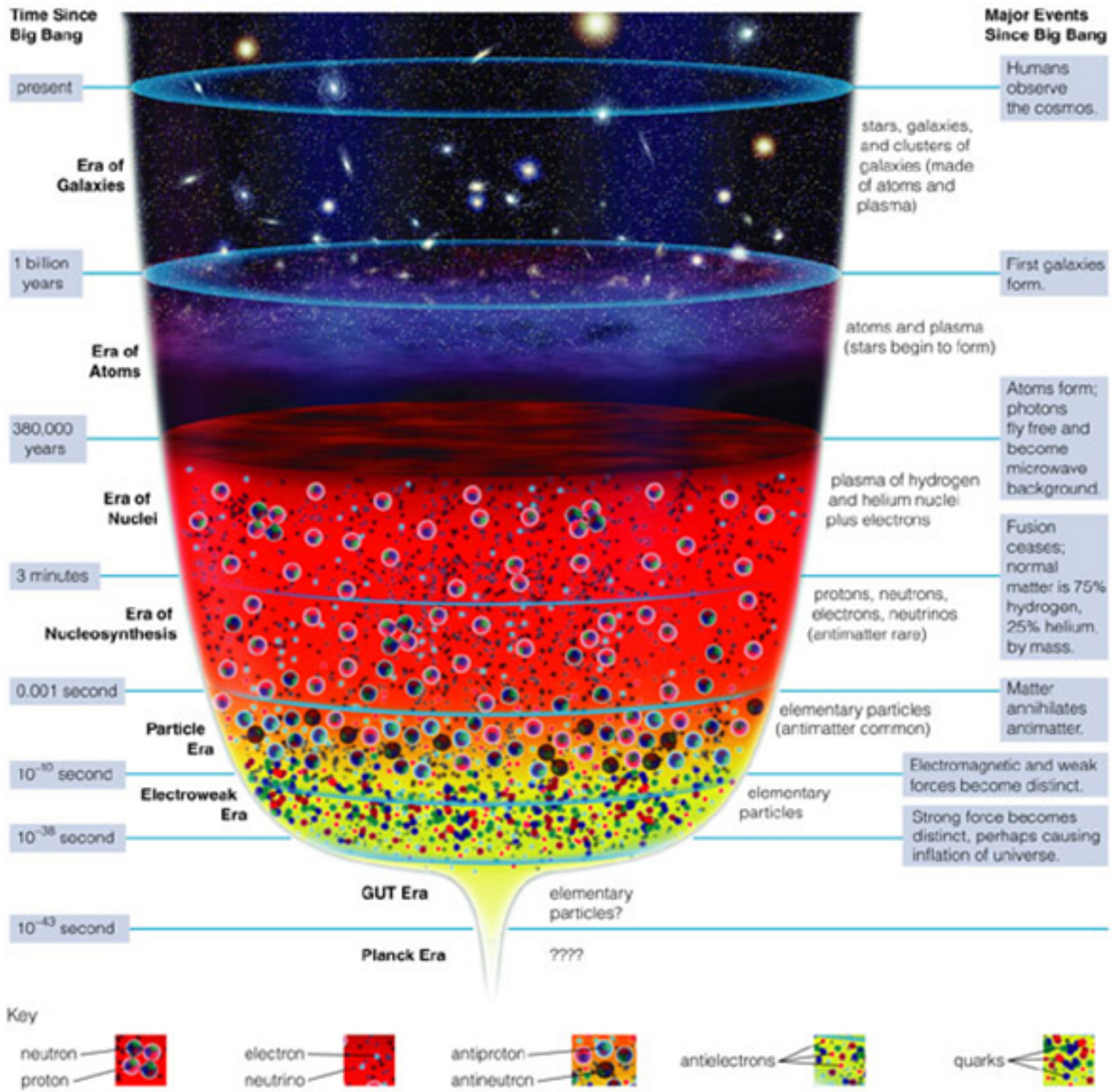

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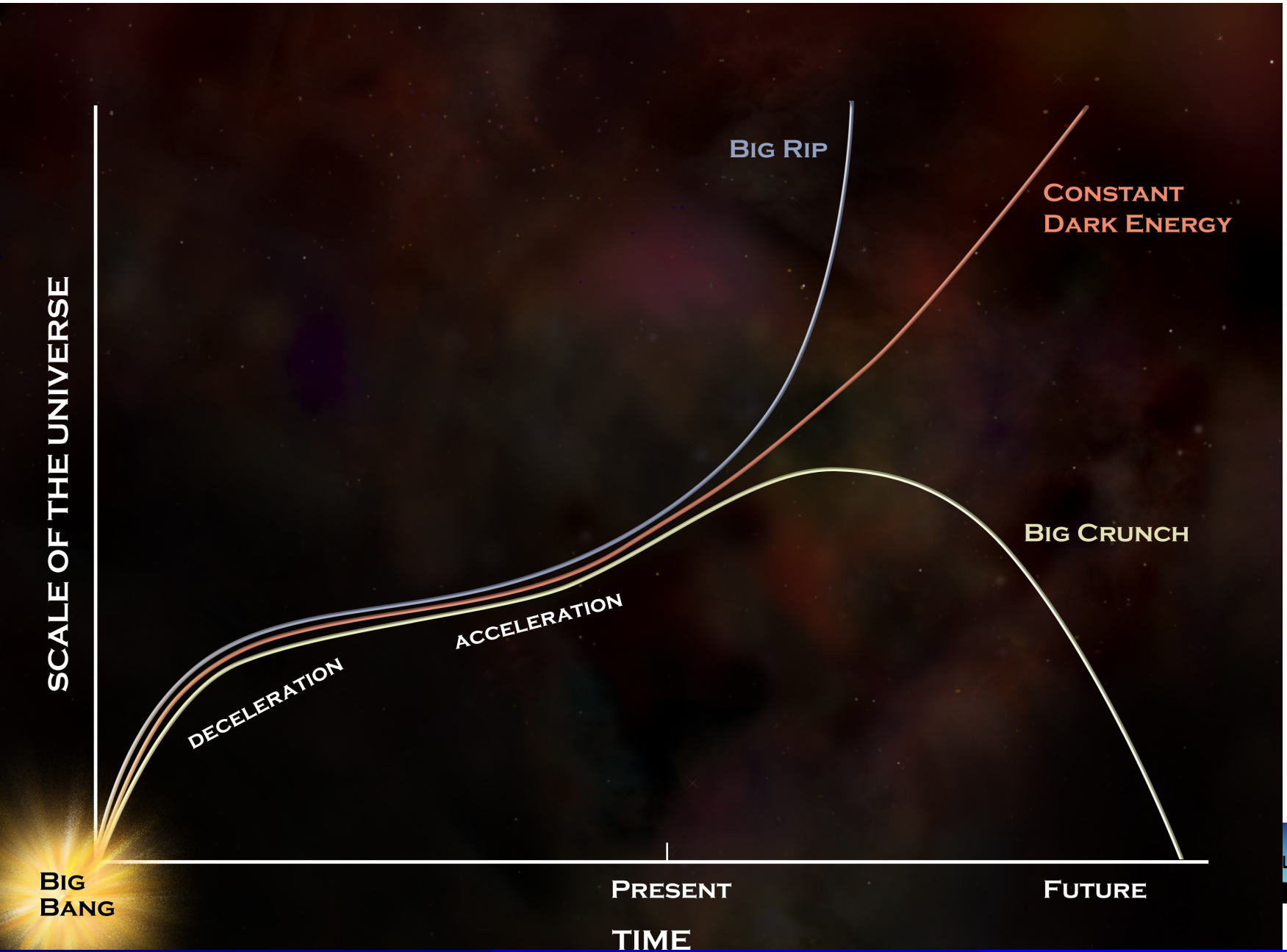

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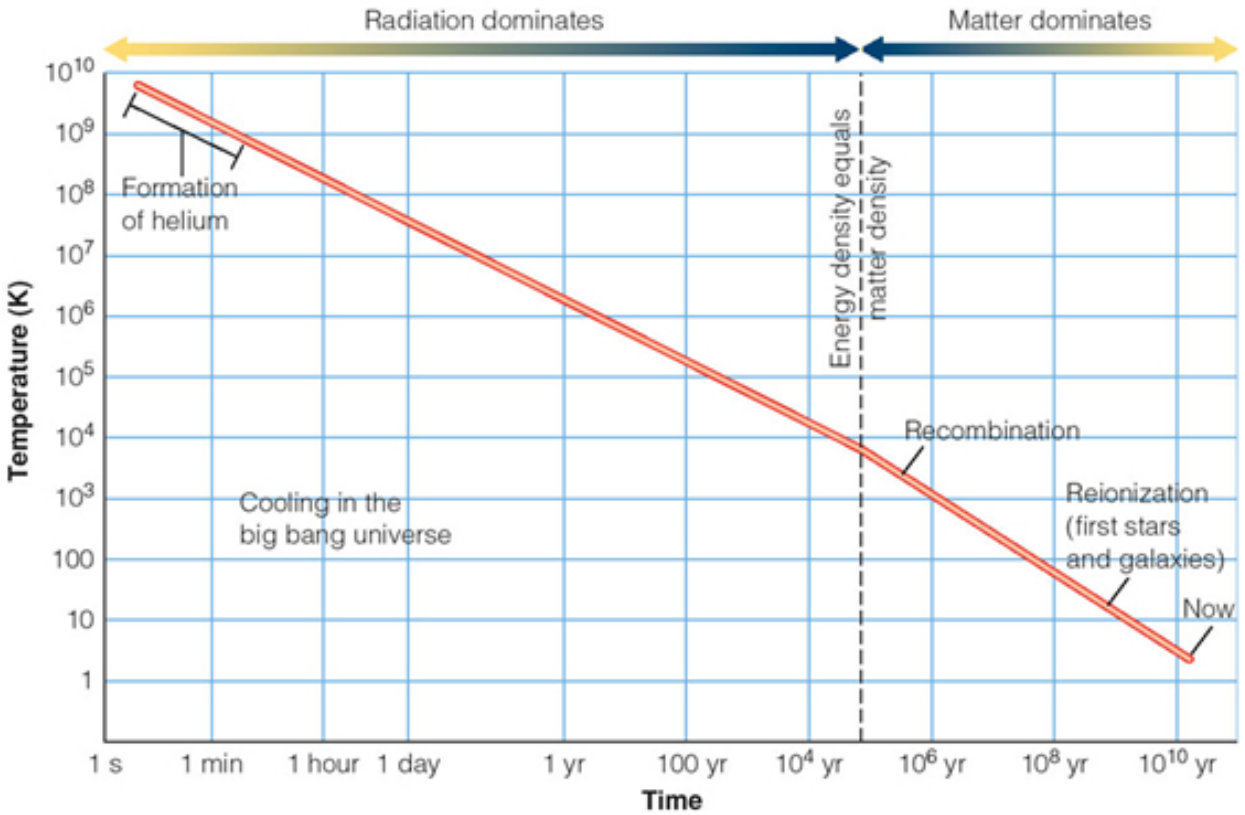

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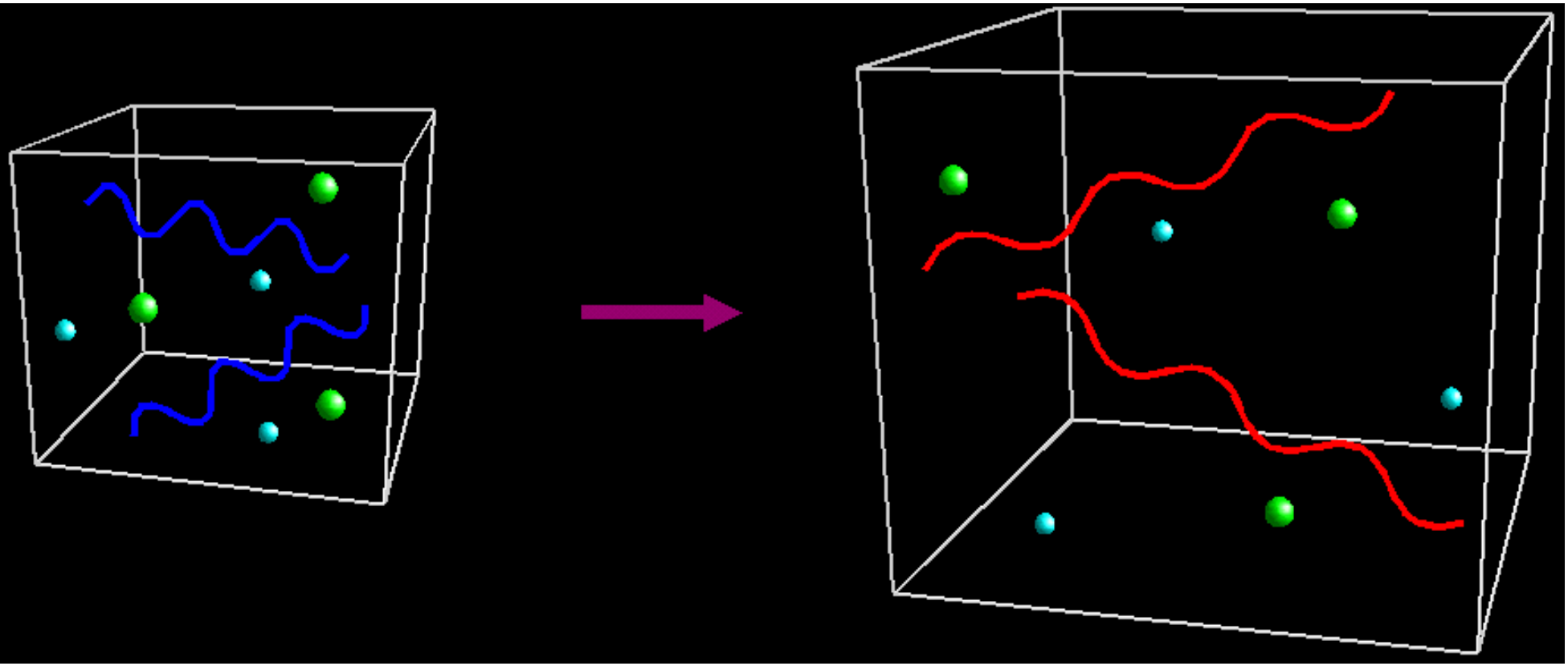

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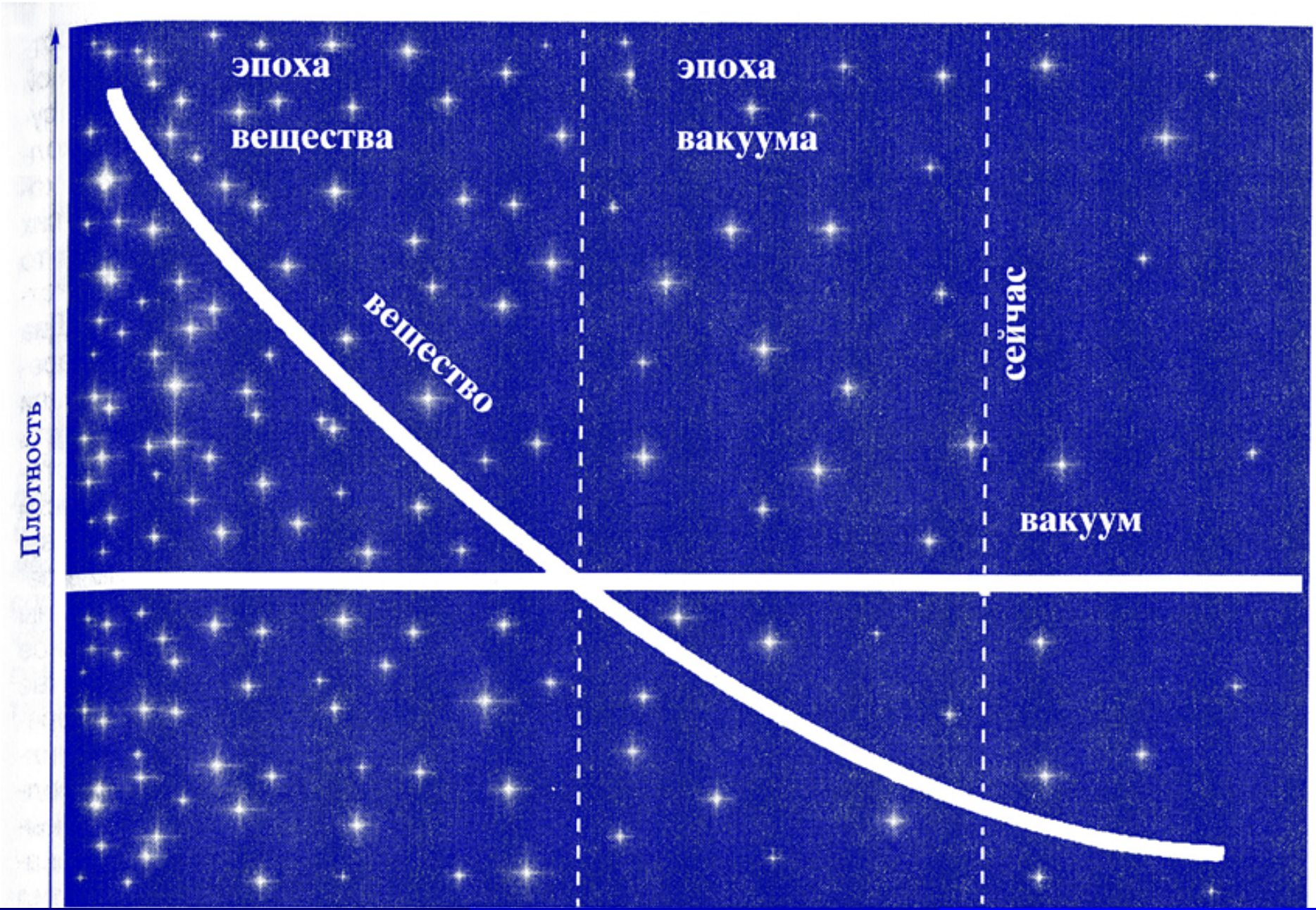

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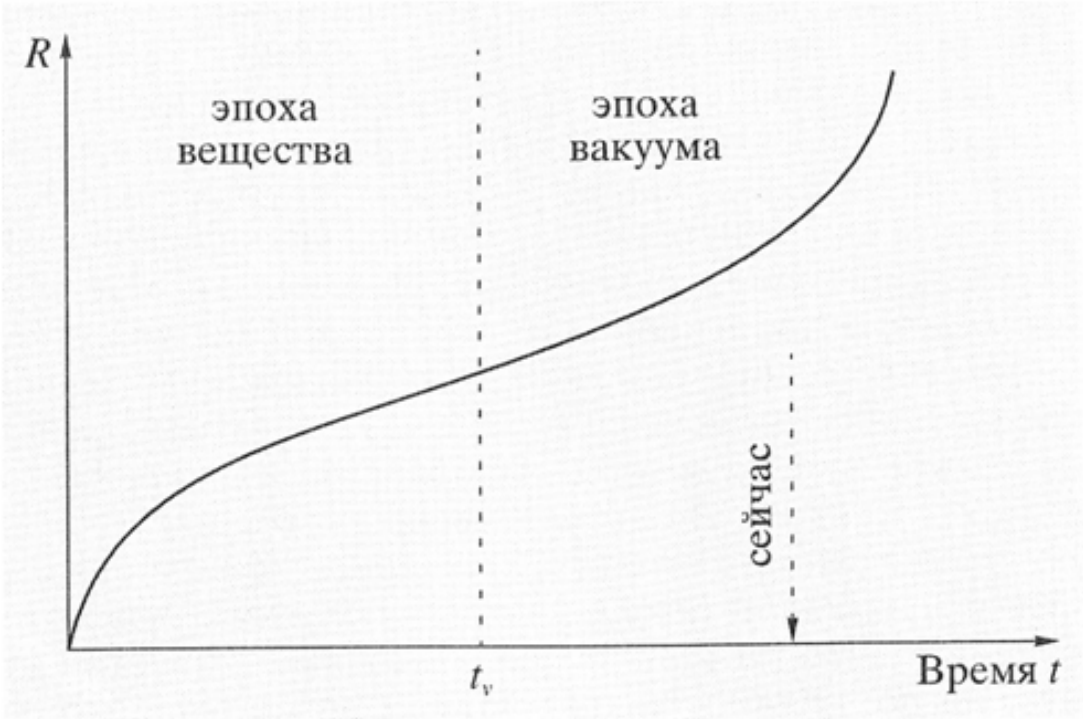

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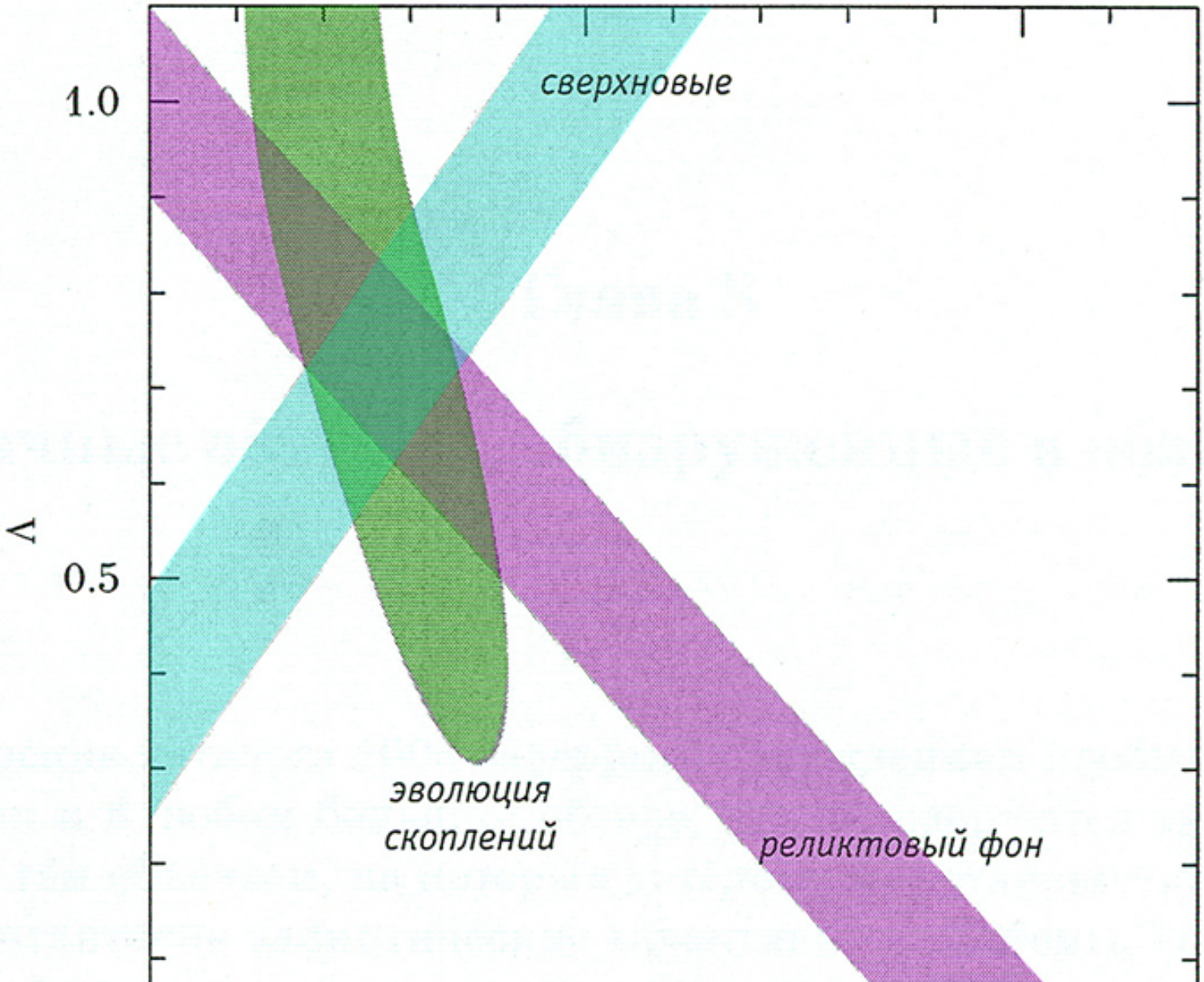
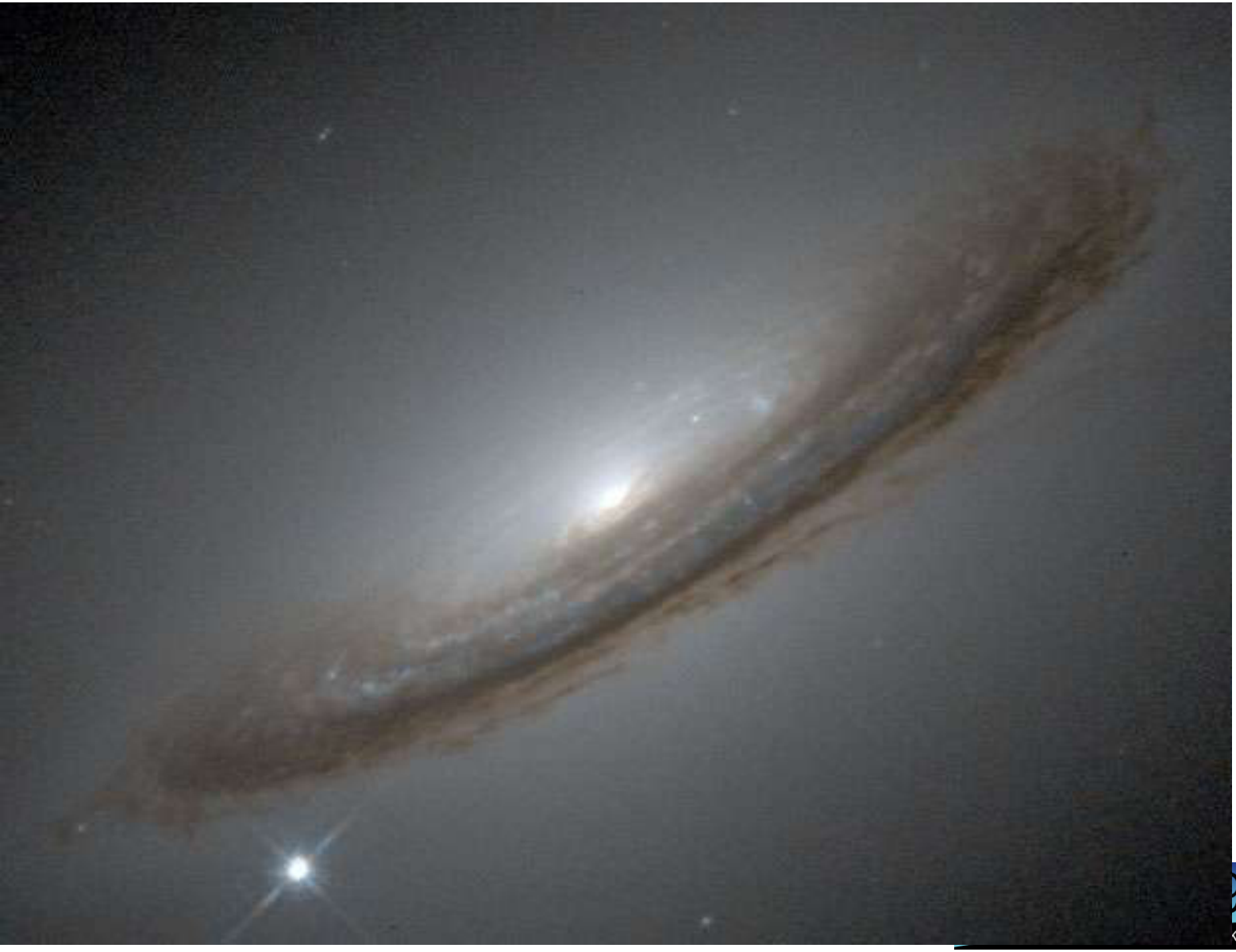
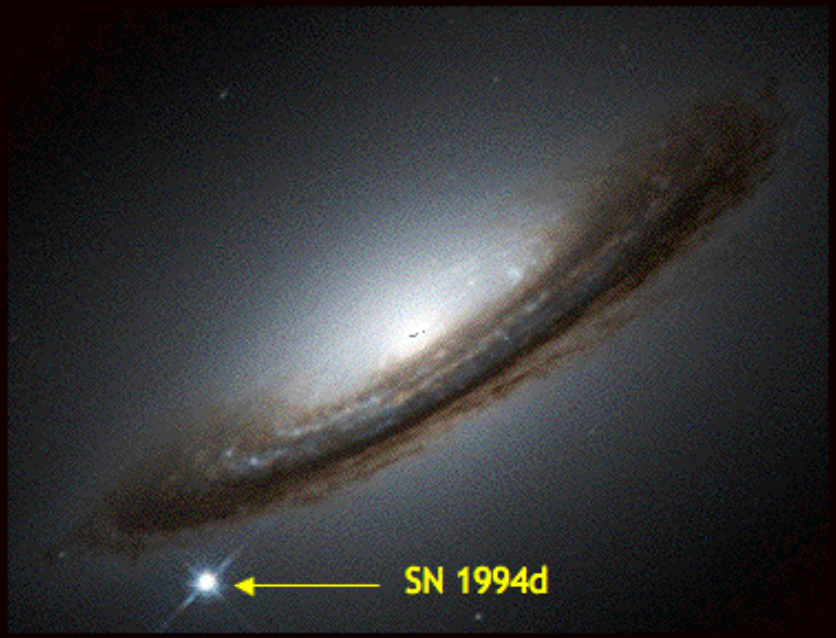


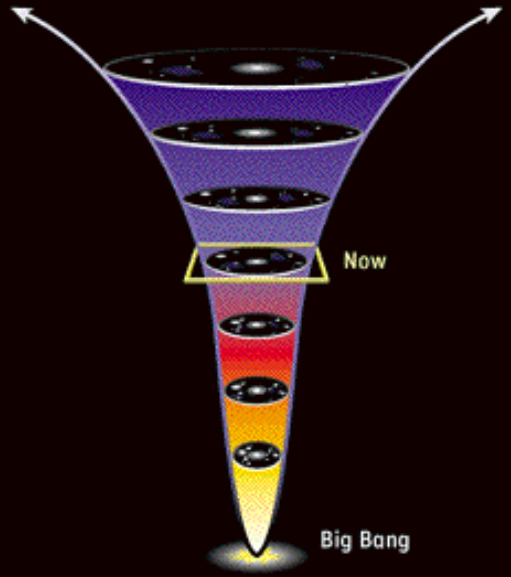
Koinotning tezlanish bilan kengayishi

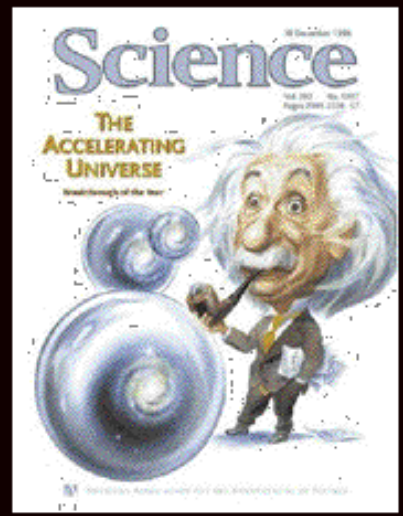


Koinotning tezlanish bilan kengayishi

Supernovae in other galaxies reveal the expansion history of the universe.

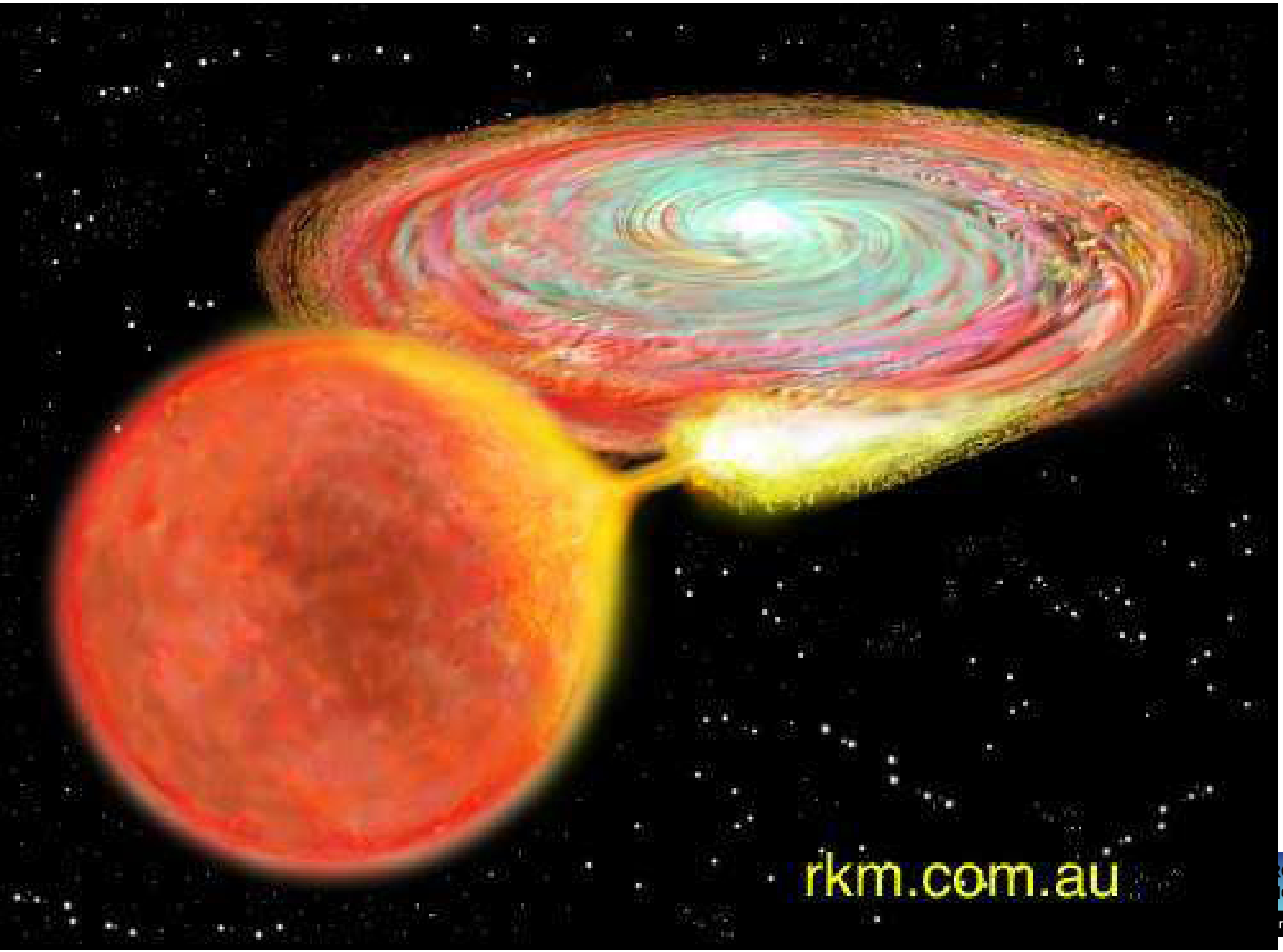






Result (1998): the expansion is speeding up, just as dark energy predicts!

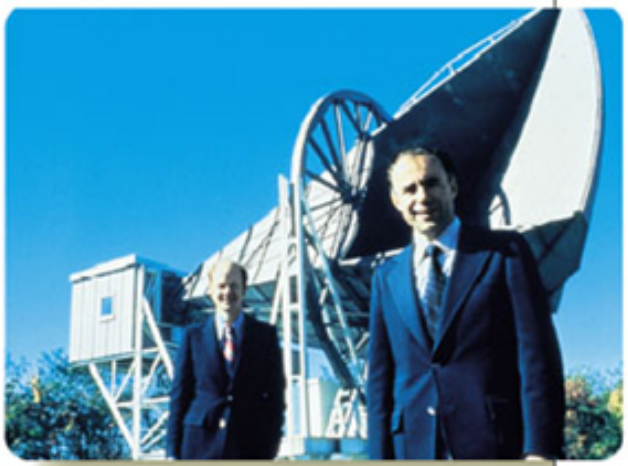
Koinotning tezlanish bilan kengayishi

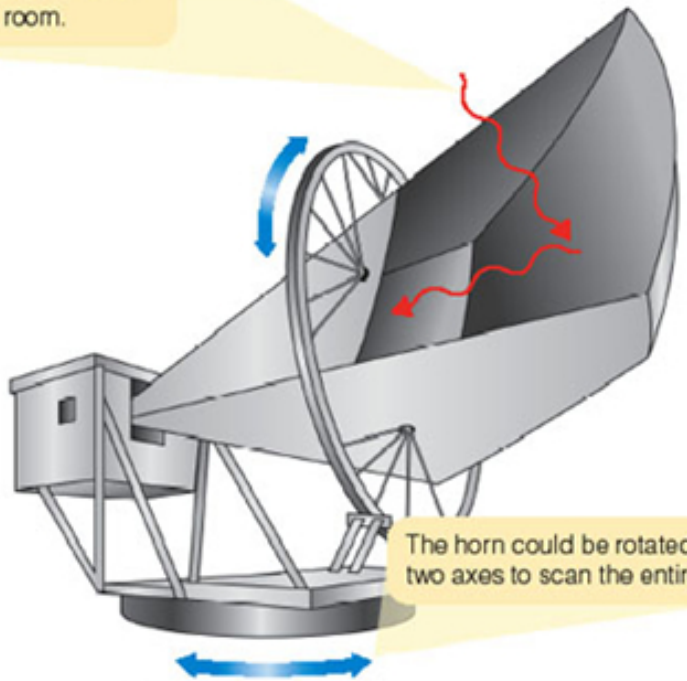


Koinotning tezlanish bilan kengayishi

Microwave radiation from the sky enters the horn and is focused into the instrument room.

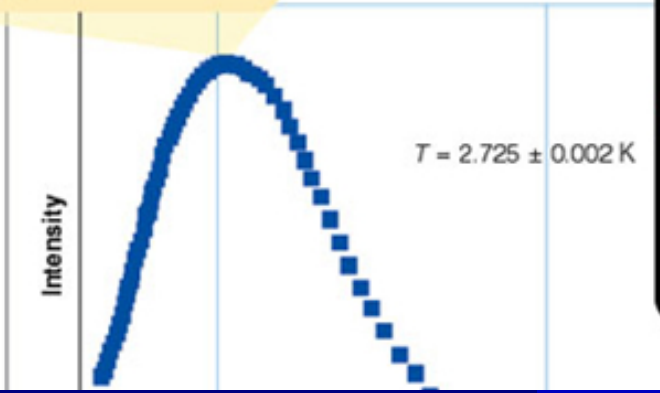
In 1965, Arno Penzias (right) and Robert Wilson first detected the background radiation with an unused horn antenna.

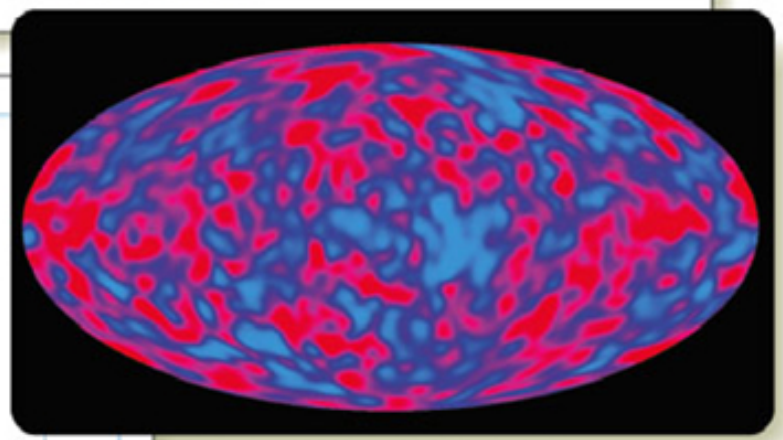




The horn could be rotated about two axes to scan the entire sky.

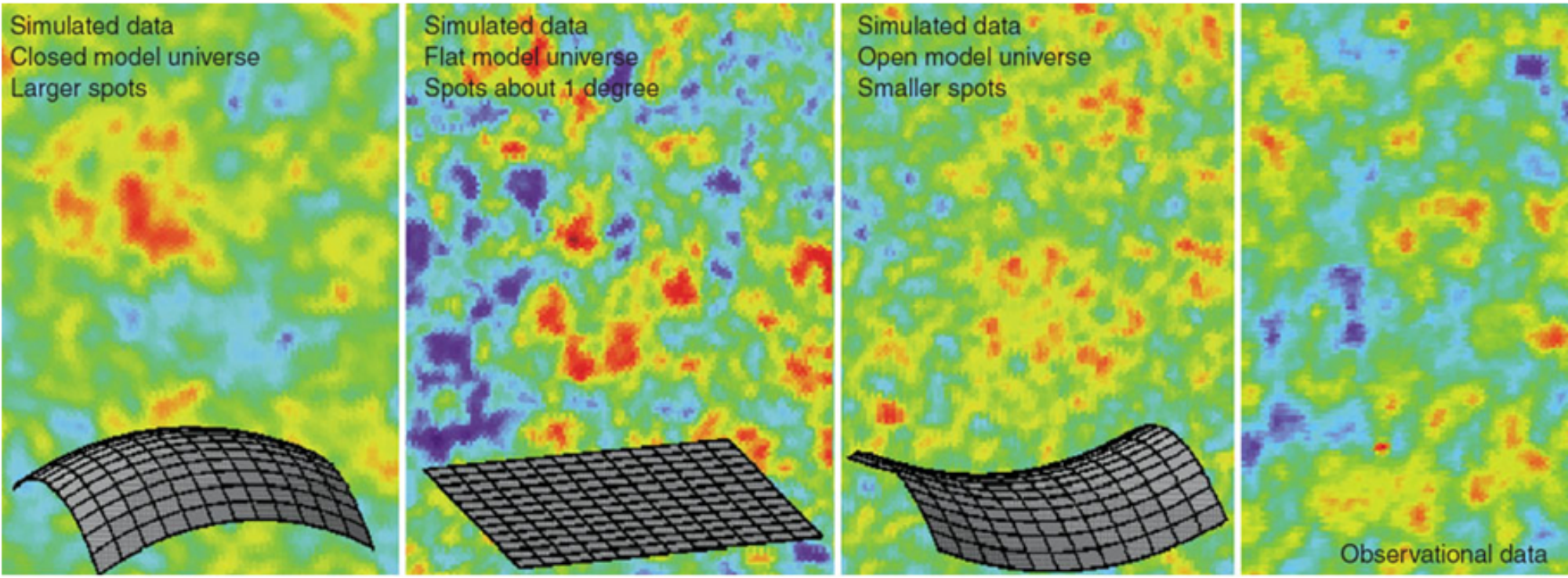
Launched in 1989, the COBE satellite showed the background radiation followed the black body curve.



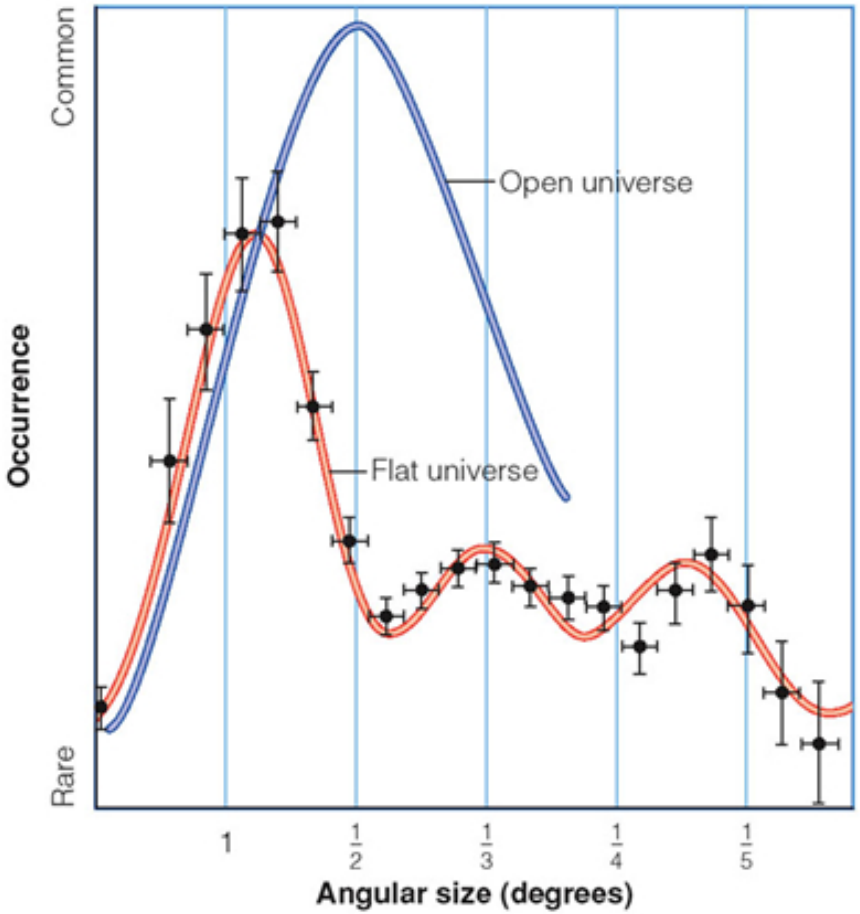


All-sky COBE map of tiny variations in the background radiation.

Koinotning tezlanish bilan kengayishi

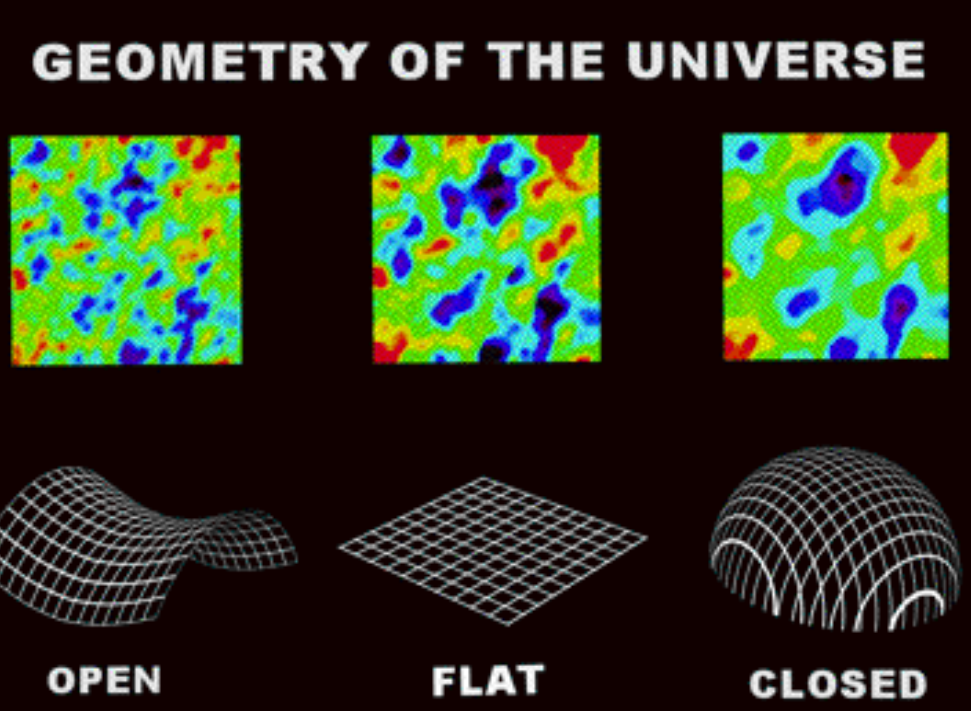


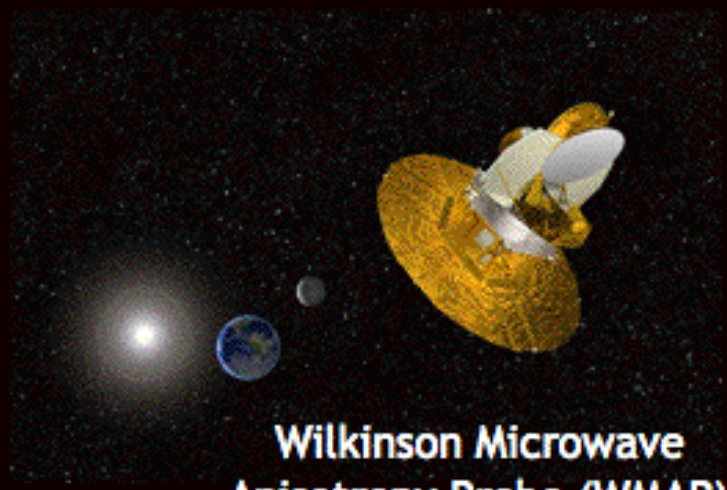
Koinotning tezlanish bilan kengayishi



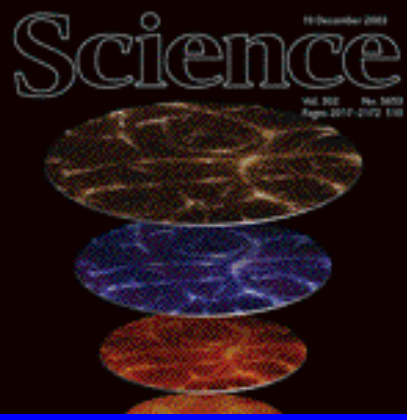
Koinotning tezlanish bilan kengayishi

Check: curvature of space measures the total energy of the universe (ordinary + DM + DE).



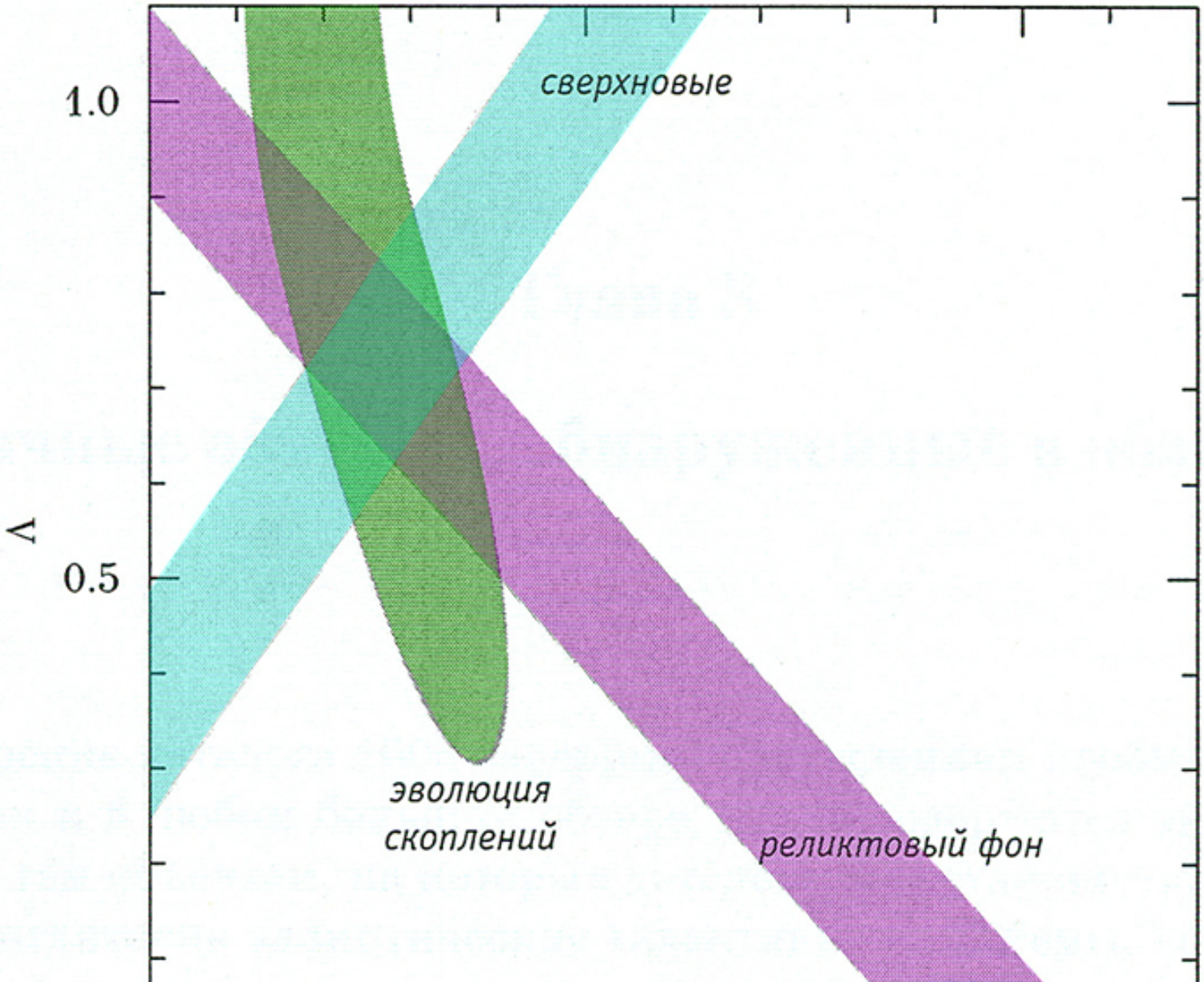


Wilkinson Microwave Anisotropy Probe (WMAP)

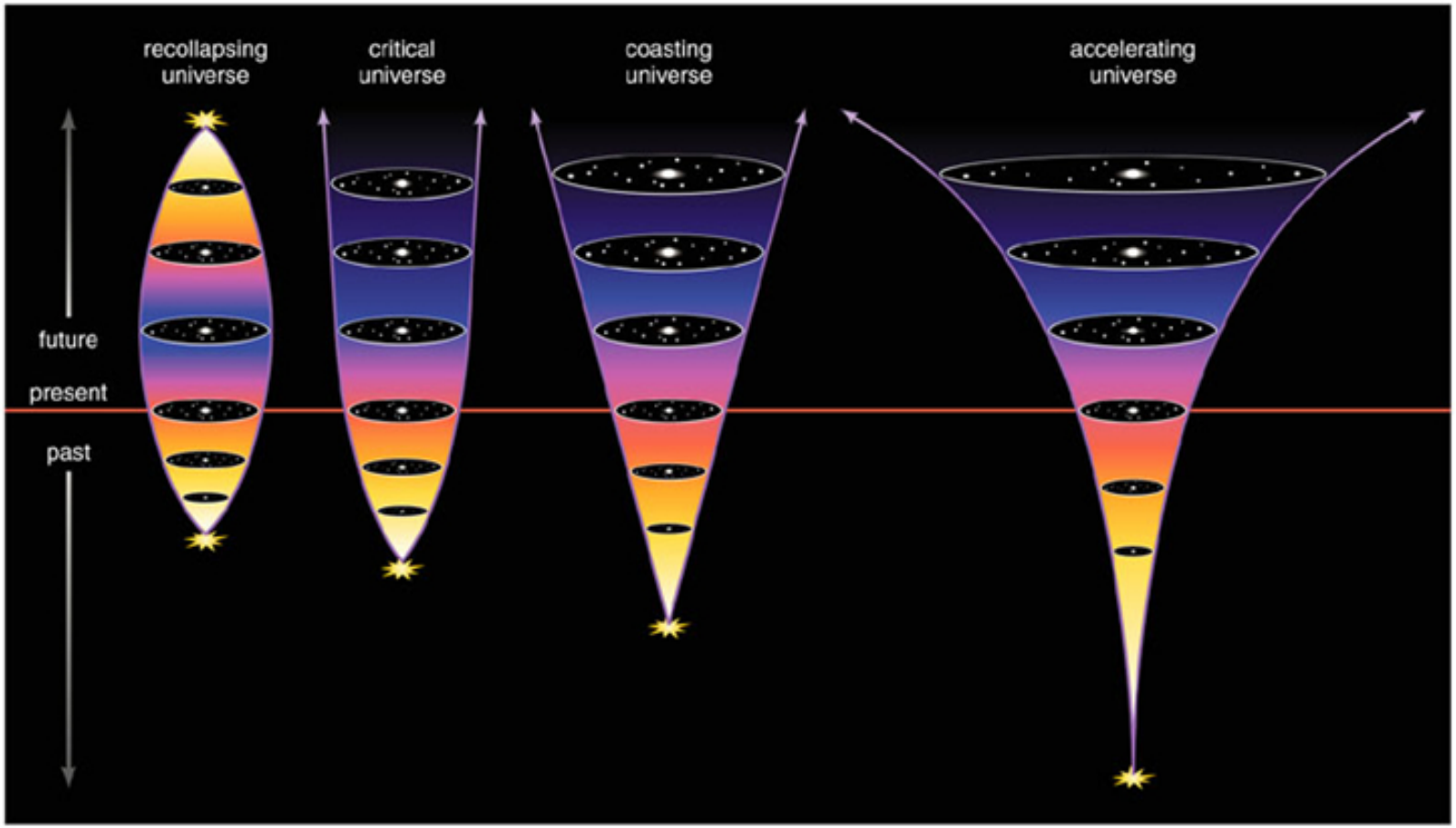


Result (2003): Need for dark energy confirmed!

Koinotning kengayishi



Koinotning kengayishi



Mundarija

1. Kirish
2. Koinotda qorong'i materiya
3. Koinotda qorong'i energiya
4. Xulosa

Xulosa

Xulosa

- What is the nature of dark matter?
- What is the nature of dark energy?
- What is origin of supermassive black holes?
- What role does dark energy and cosmic acceleration play?
- What is the origin of matter-antimatter asymmetry?
- Is the inflationary theory correct?
- What is the inflaton or cyclic field responsible?
- How far does space extend?
- Is the Big Bang a beginning of space and time?
- Why are there three large spatial dimensions?

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TASHAKKUR [1]

[1] Umid qilamanki siz zavq oldingiz ... va hozirgi payt uyg'oqsiz