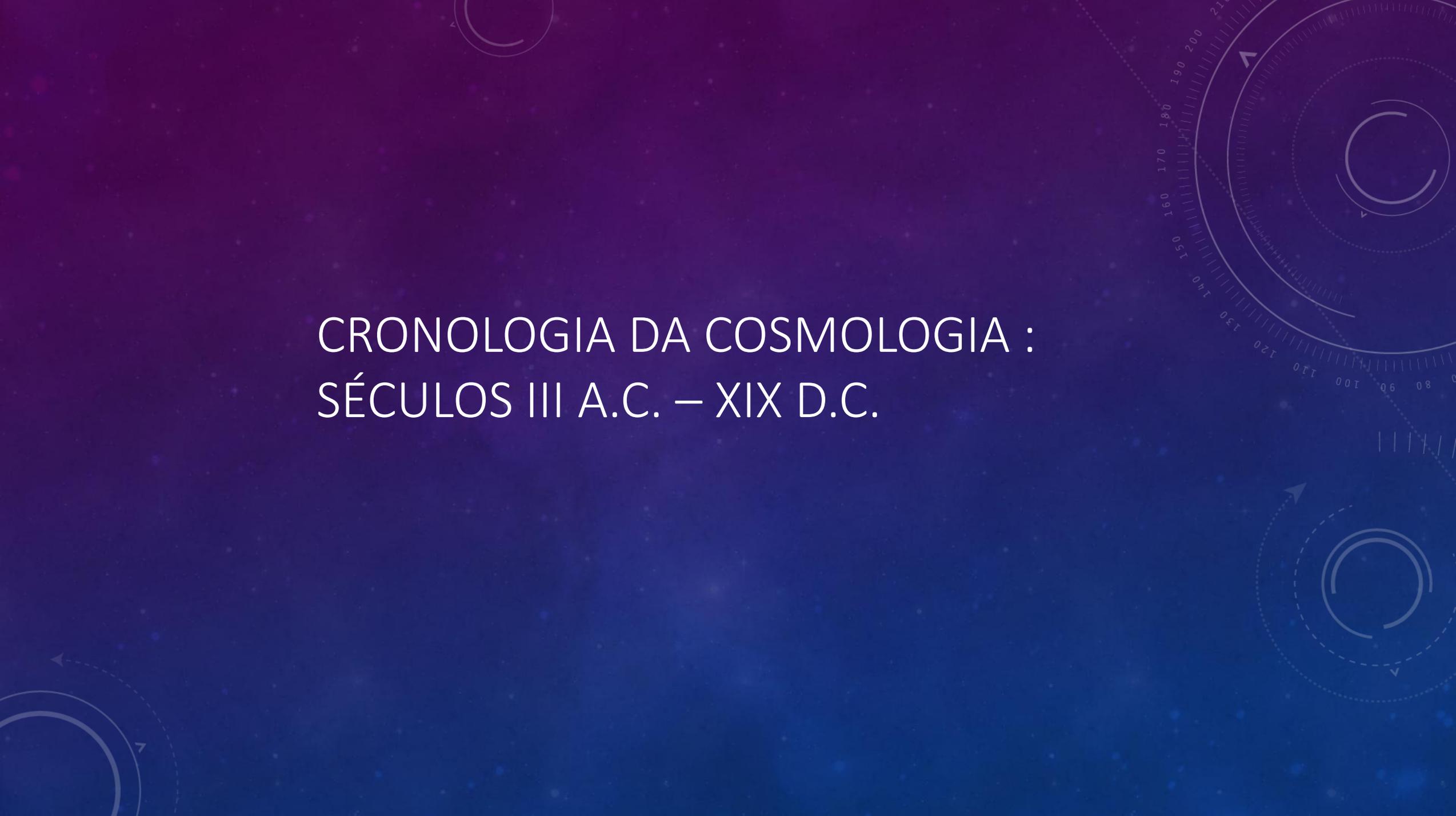


The background is a dark blue gradient with a starry texture. On the left side, there are several overlapping circular elements. A prominent one is a large arc with a scale from 140 to 260 in increments of 10. Other circles are partially visible, some with dashed lines and arrows, suggesting a complex geometric or scientific theme.

BREVE HISTÓRIA DA COSMOLOGIA

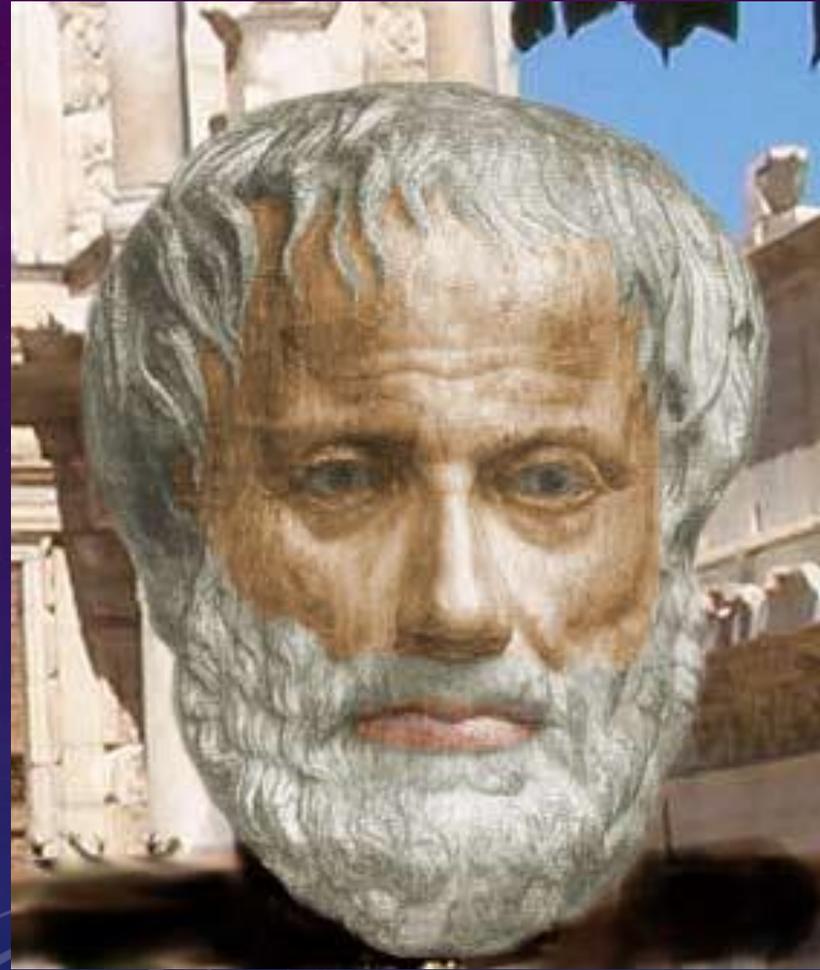
MAS, O QUE É COSMOLOGIA?

- Da definição: “A **cosmologia** moderna, numa **definição** simples, é a ciência que estuda a origem e evolução do Universo, e em particular da sua estrutura em larga escala, com base em leis físicas. ”

The background is a dark blue gradient with a field of small white stars. Overlaid on this are several faint, light blue circular diagrams. One large diagram in the upper right quadrant features concentric circles and radial lines, with numerical labels (100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210) along its outer edge. Other diagrams consist of simple concentric circles and dashed lines with arrows, suggesting a technical or scientific theme.

CRONOLOGIA DA COSMOLOGIA : SÉCULOS III A.C. – XIX D.C.

- Aristóteles (III a.C.)



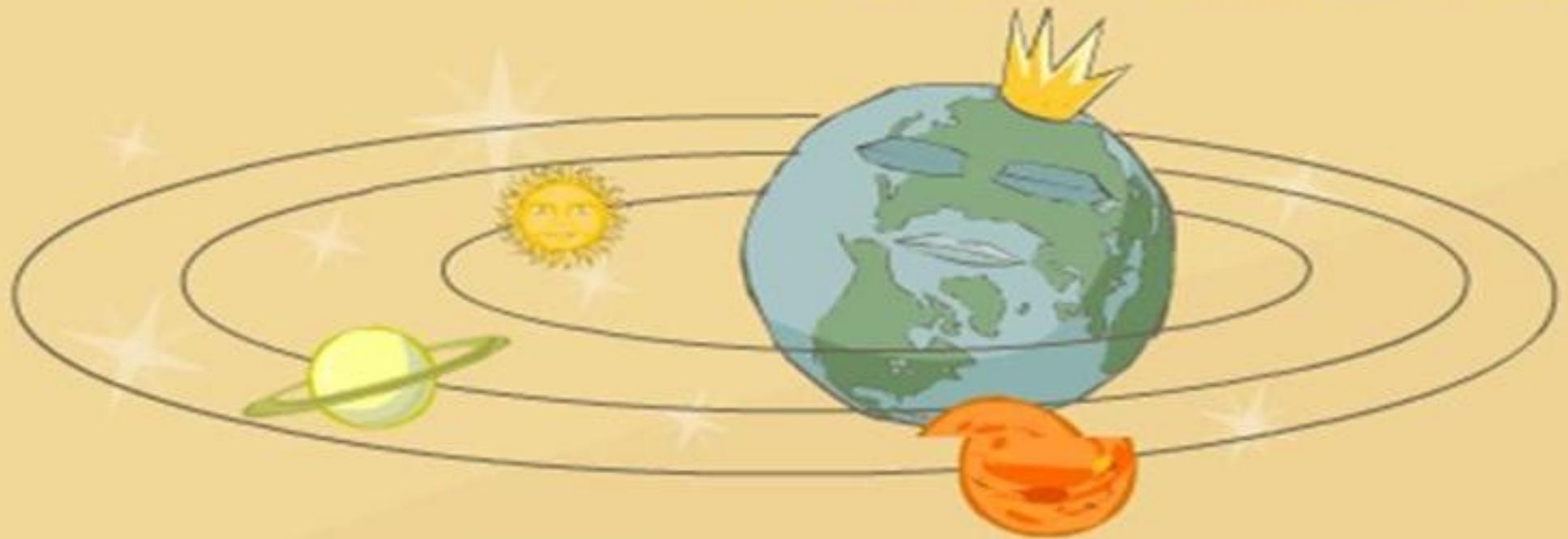
- Ptolomeu (150 d.C.)

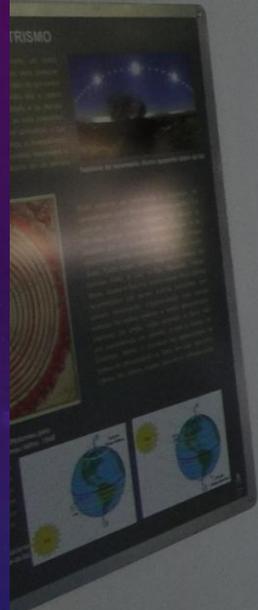
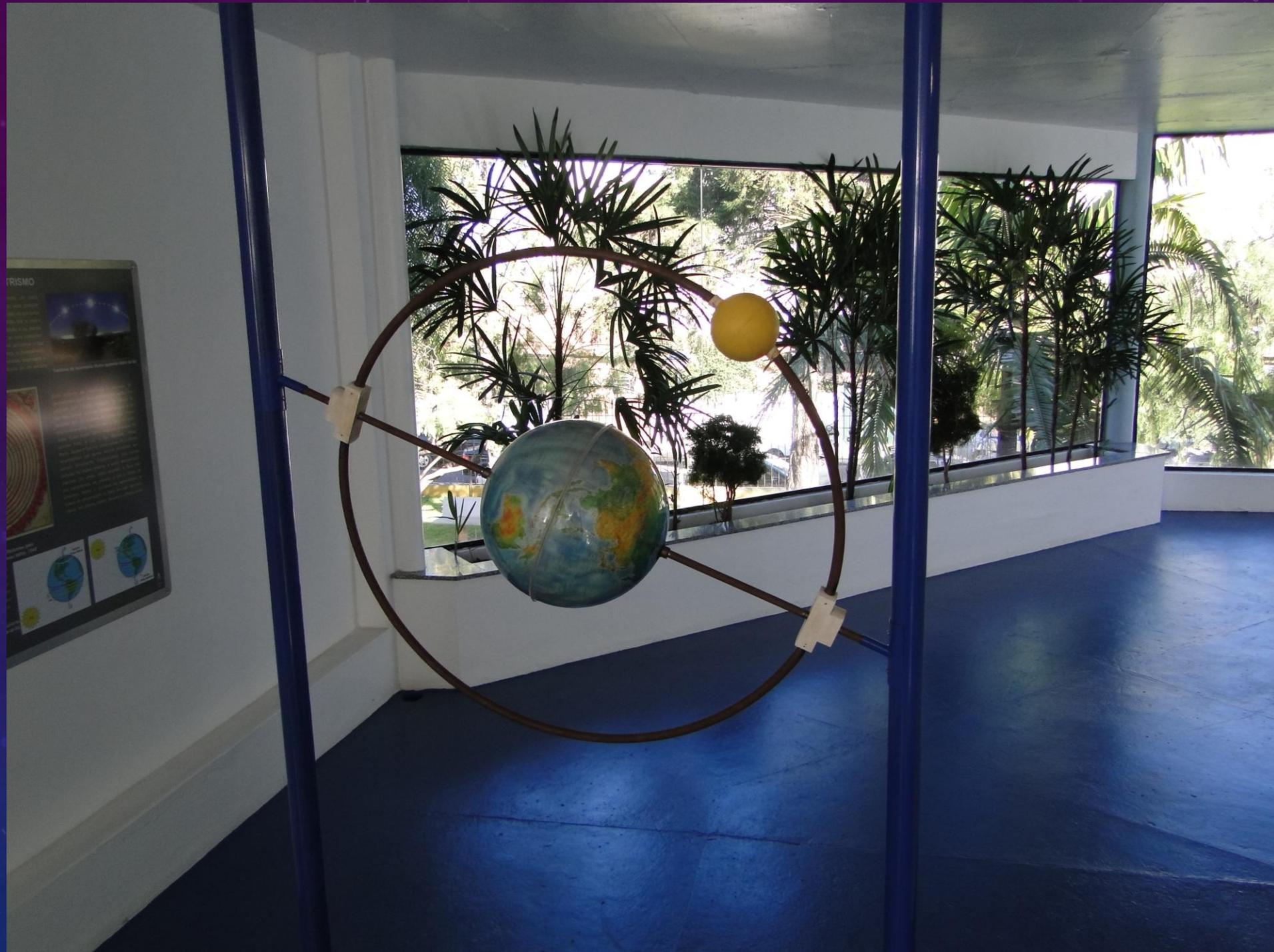


MODELO GEOCÊNTRICO

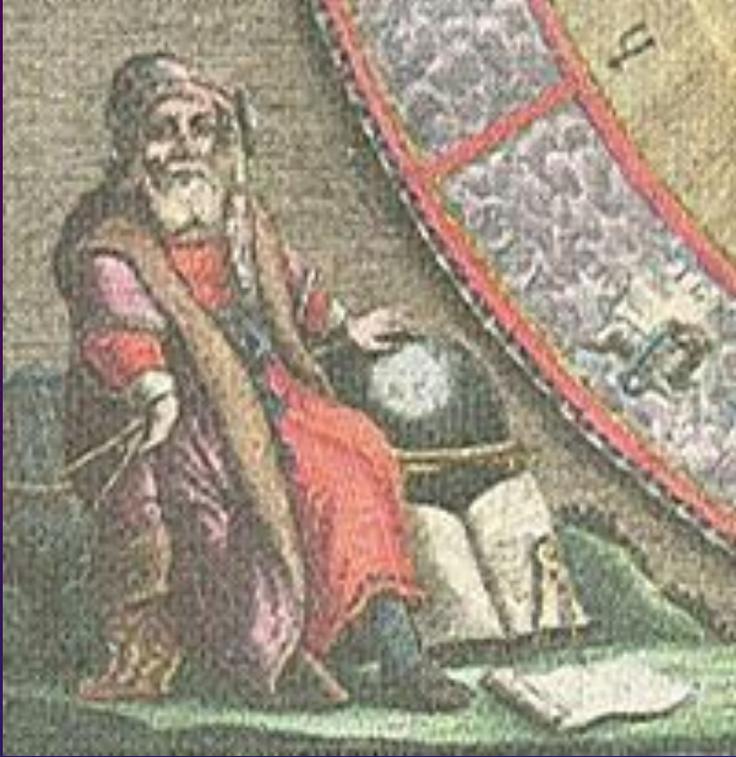
Geocentrismo

Imagem: recorte do recurso do portal do professor
http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash&Lang=BrazilianPortuguese

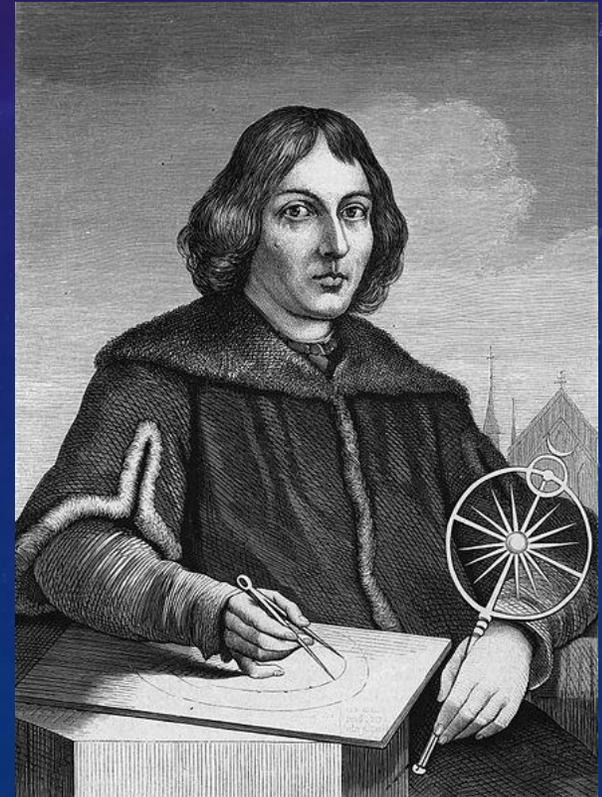




- Aristarco de Samos (séc. III a.C.) – Heliocentrismo.



- Copérnico(Séc. 500 d.C.) :



Heliocentrismo

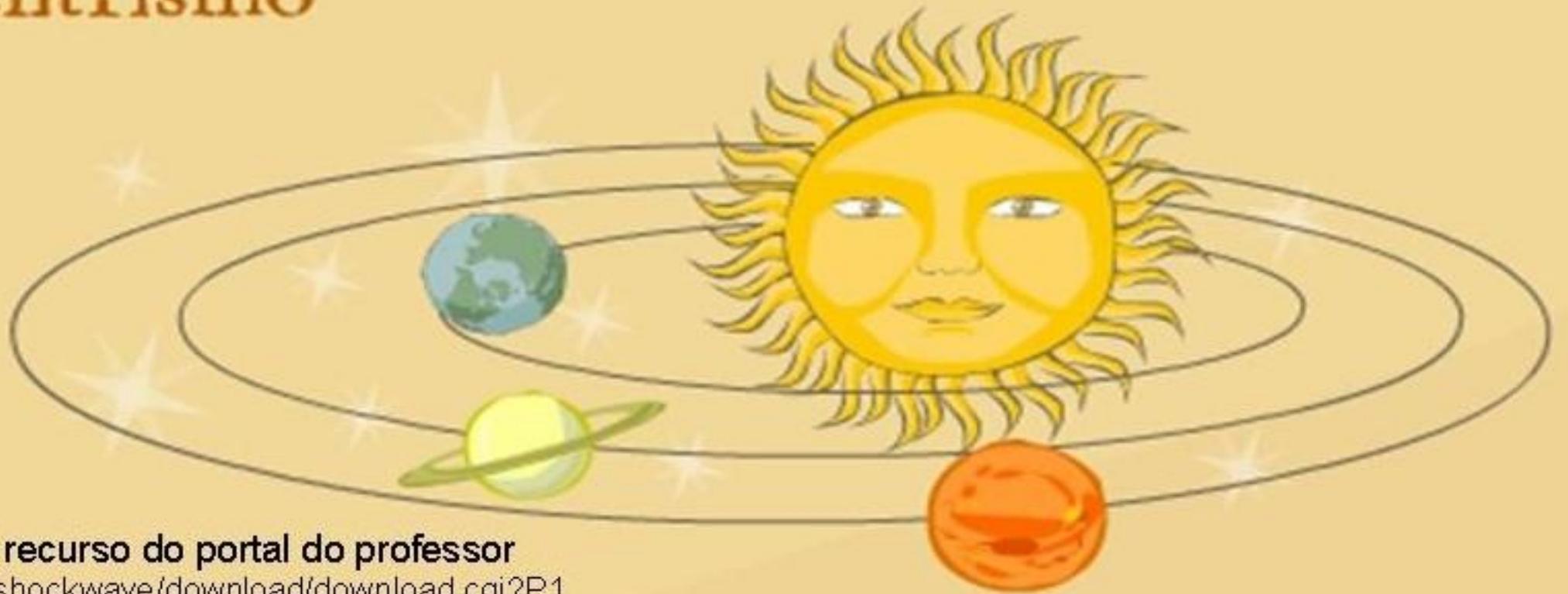


Imagem: recorte do recurso do portal do professor
http://www.adobe.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash&Lang=BrazilianPortuguese

- Giordano Bruno(1584) :

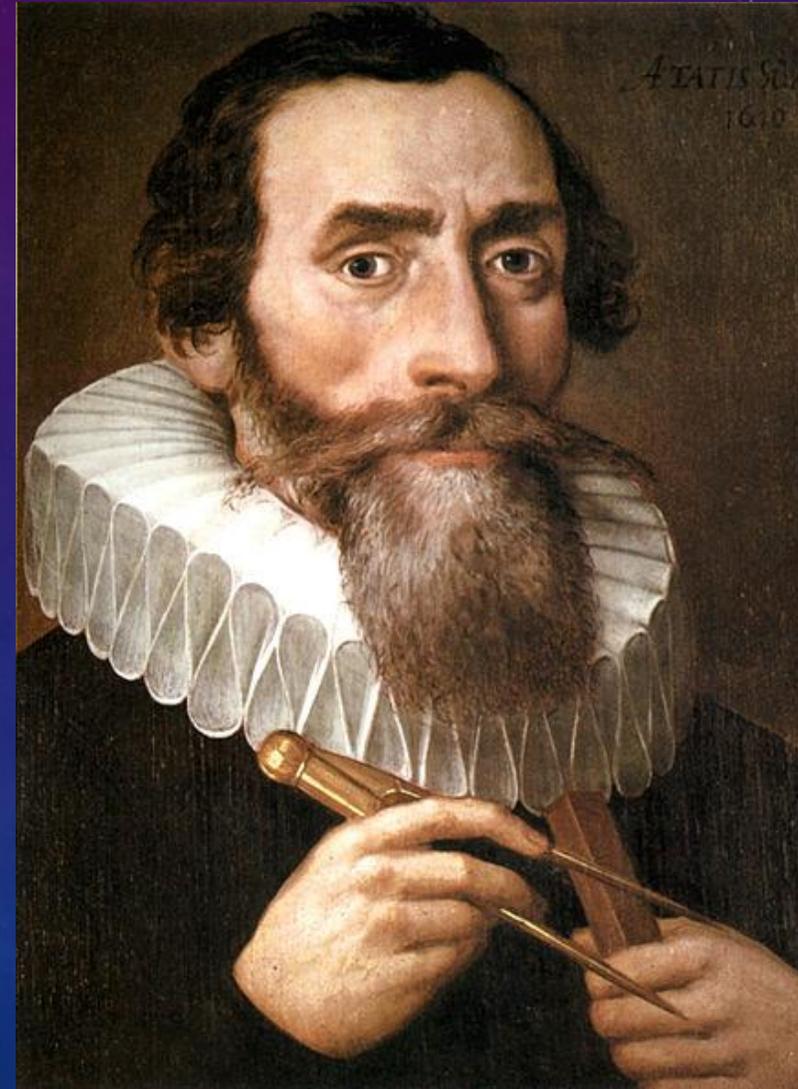


"Talvez sintam maior temor ao pronunciar esta sentença do que eu ao ouvi-la"

- Tycho Brahe (1577)

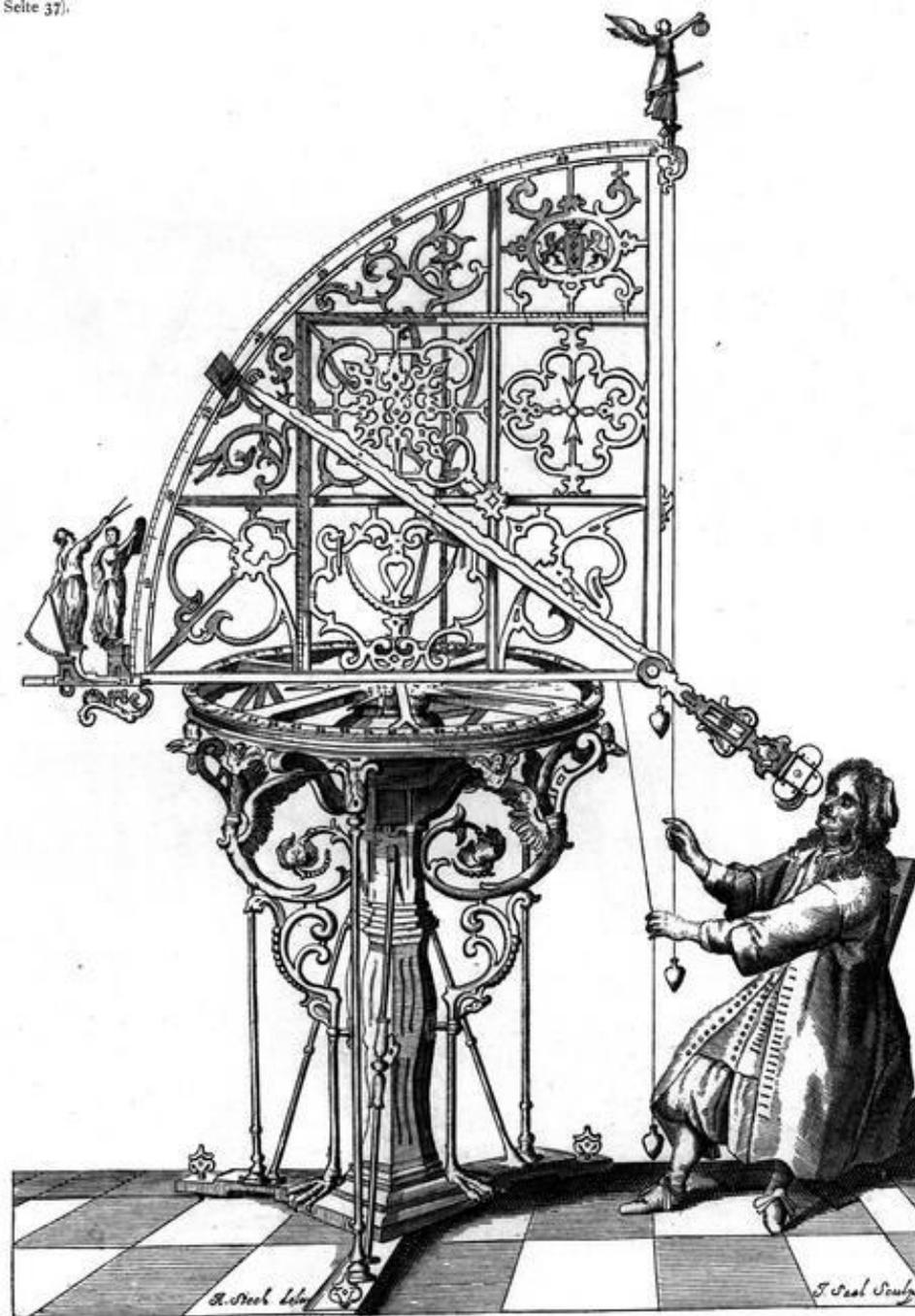


- Kepler(1610)



QUADRANTE

(zu Seite 37).

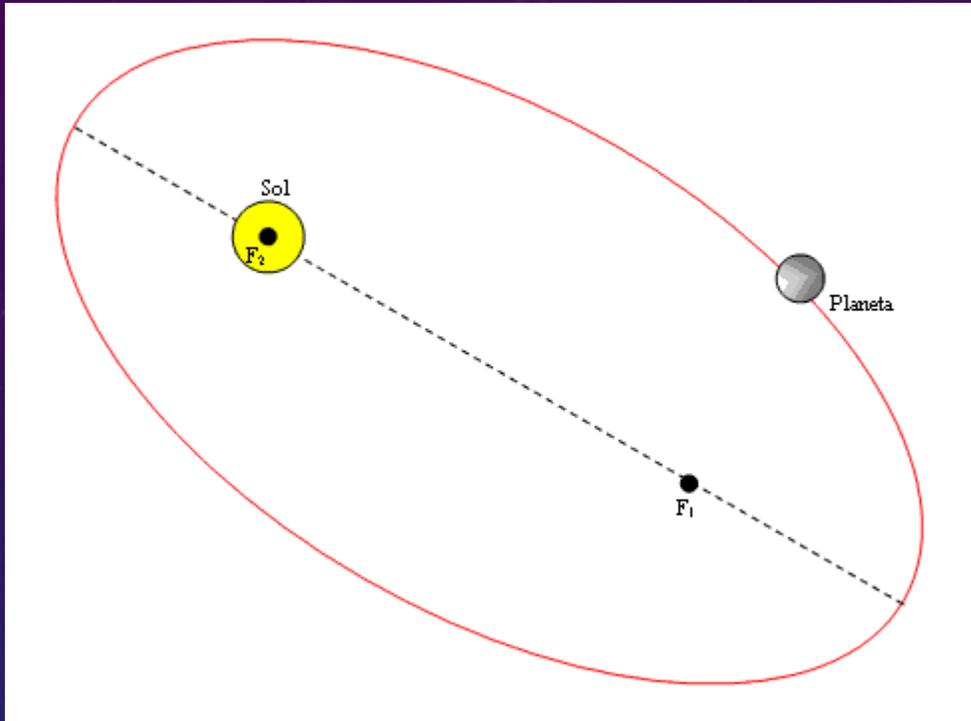


Crüger's großer Azimuthal-Quadrant, vollendet von Hevel 1644,
nach Hevel's Machina coelestis.

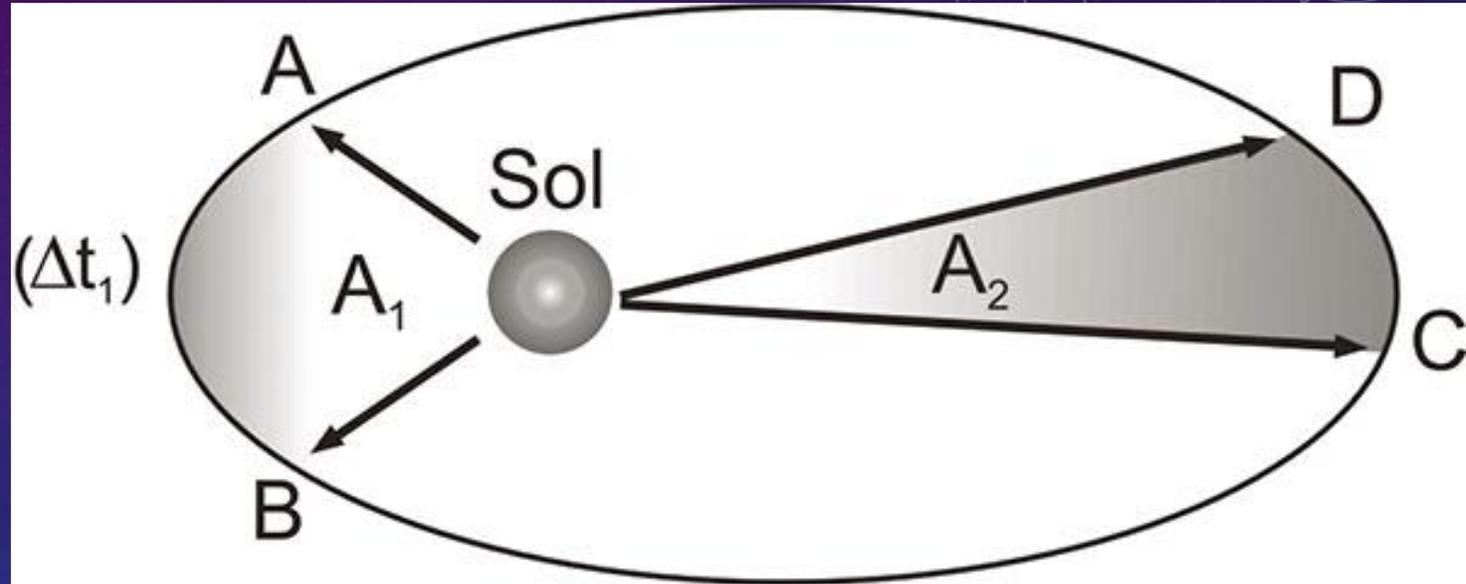


LEIS DE KEPLER

- 1ª Lei: Órbitas elípticas



- 2ª Lei: Áreas



- 3ª Lei: Períodos

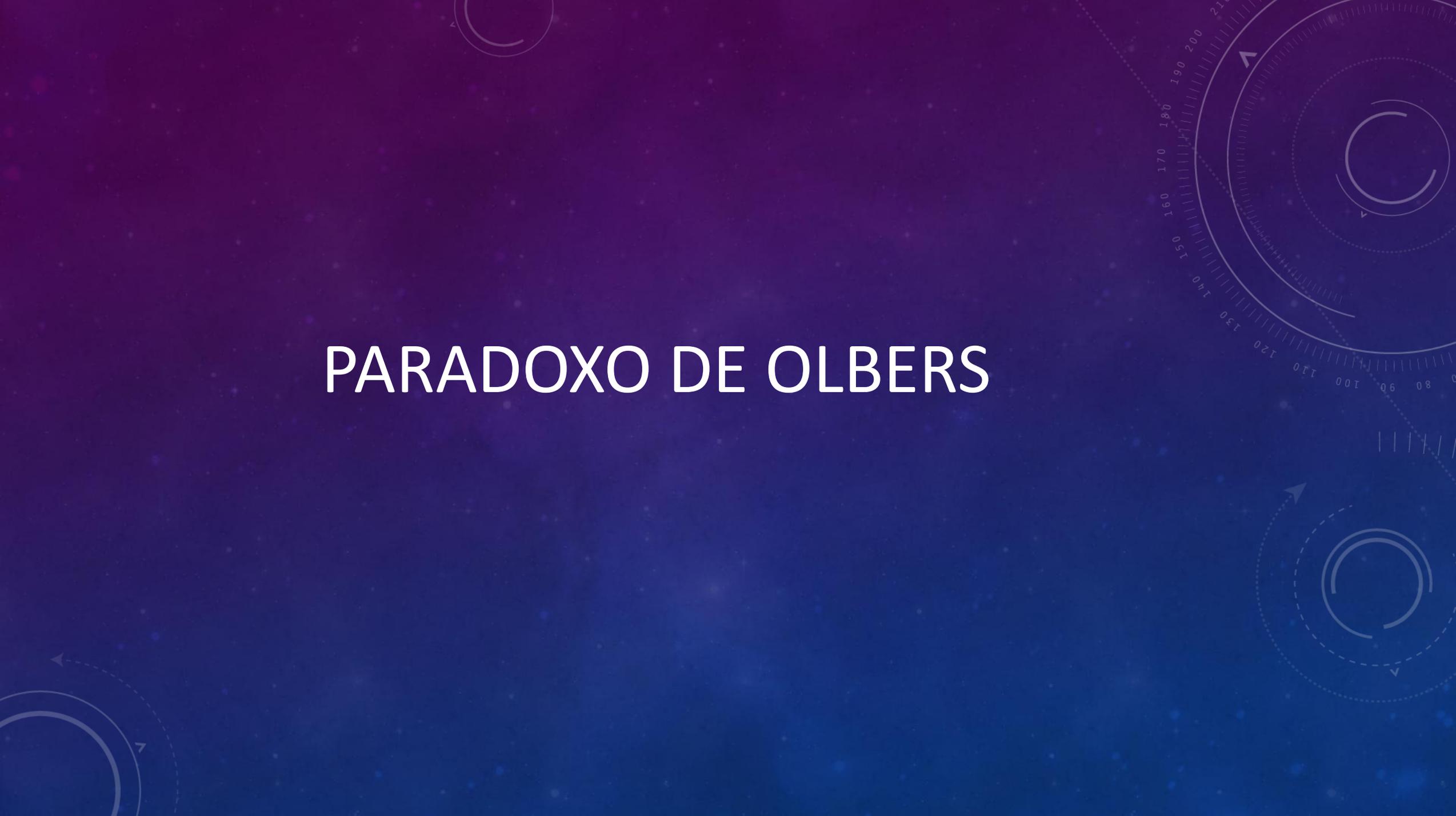
- Newton(1687)



- Lei da Gravitação Universal

$$F = G * \frac{M * m}{d^2}$$

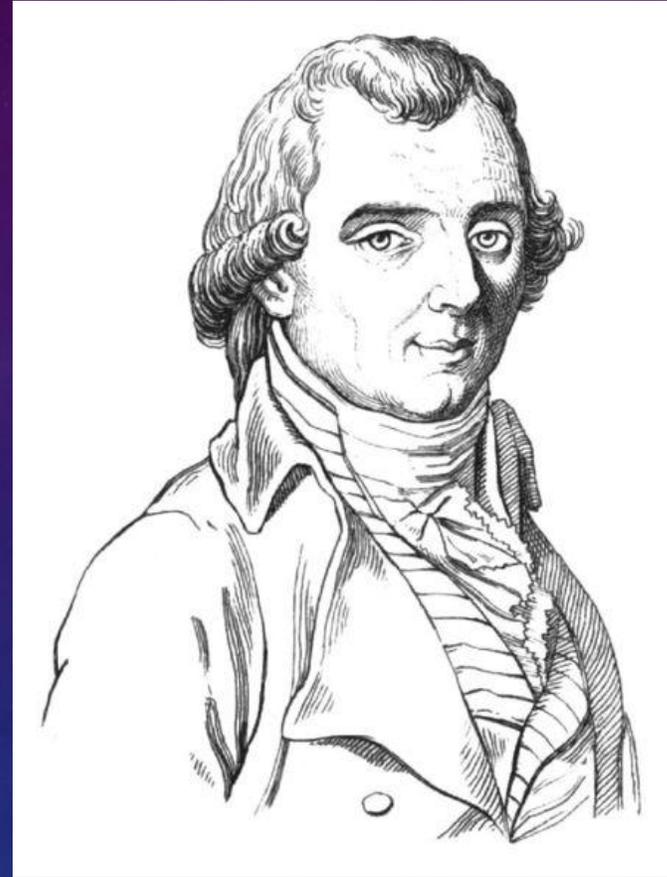
PARADOXO DE OLBERS

The background features a gradient from dark purple to blue, overlaid with a field of small white stars. On the right side, there are several technical diagrams: a large circular scale with numerical markings from 80 to 210, a smaller circular diagram with concentric lines and arrows, and another diagram with dashed lines and arrows. In the bottom left corner, there are faint circular outlines and arrows.

- Jean-Philippe de Chéseaux (1744):



- Heinrich Olbers (1826):



- Edgar Allan Poe(1848)

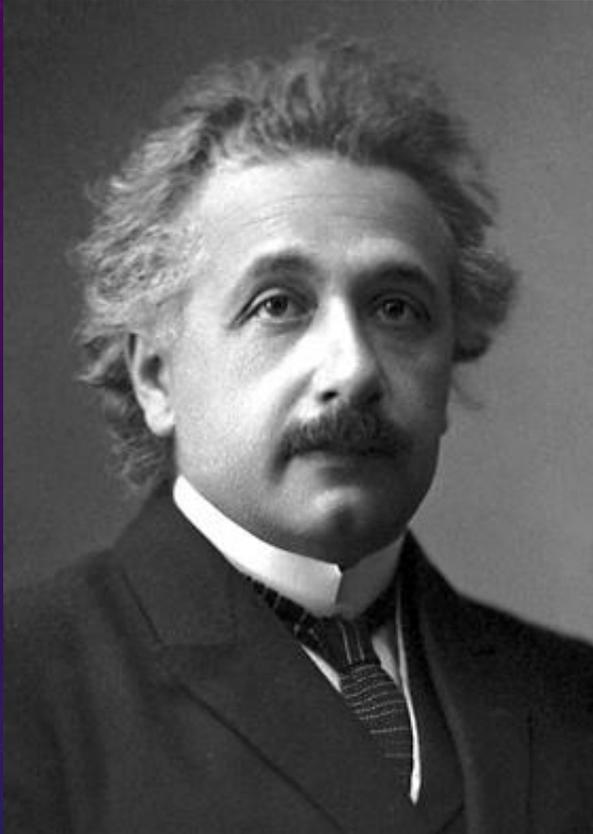


SÉCULO XX

The background is a dark blue gradient with a field of small white stars. Overlaid on this are several technical diagrams in a lighter blue color. In the top right, there is a large circular diagram with concentric rings and radial lines, resembling a scale or a gauge, with numbers from 80 to 210. In the bottom right, there is a smaller circular diagram with concentric rings and a dashed outer boundary, with an arrow pointing clockwise. In the bottom left, there is another circular diagram with concentric rings and a dashed outer boundary, with an arrow pointing counter-clockwise. In the top left, there is a small circular diagram with a dashed outer boundary and an arrow pointing counter-clockwise.

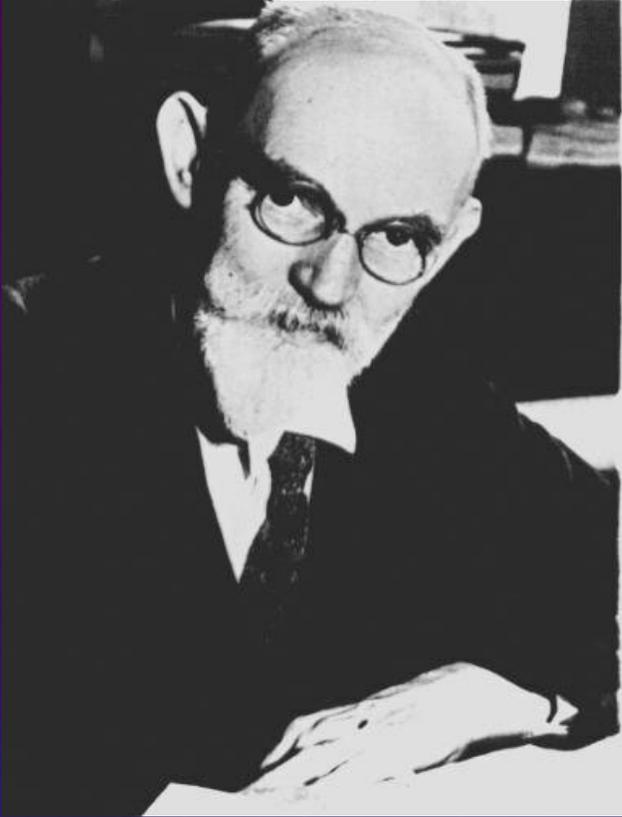
- Problema:
- Galileu e a velocidade relativa:
- Ex. Pessoa correndo em um ônibus. Soma-se a velocidade da pessoa e do ônibus. (de um referencial inercial)
- Mas
- Velocidade da luz constante
- As estrelas tem luz e velocidades,
- Logo a velocidade final não deveria ser a velocidade da luz+estrelas?

- Albert Einstein (1905 e 1915):

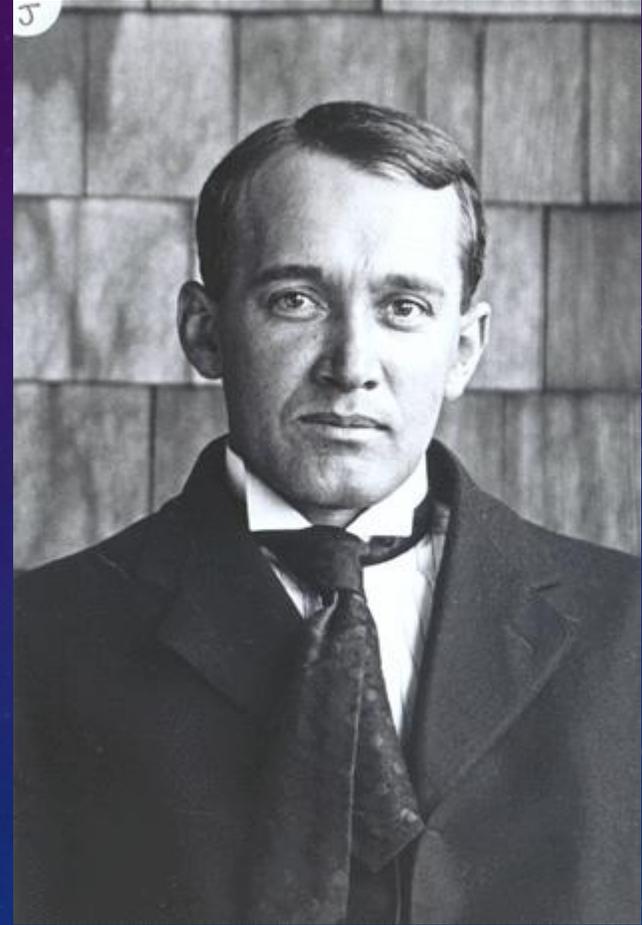


- 1905: Relatividade Restrita
- 1915: Relatividade Geral
- (https://cienciasetecnologia.com/wp-content/uploads/2013/08/buraco_negro.gif)

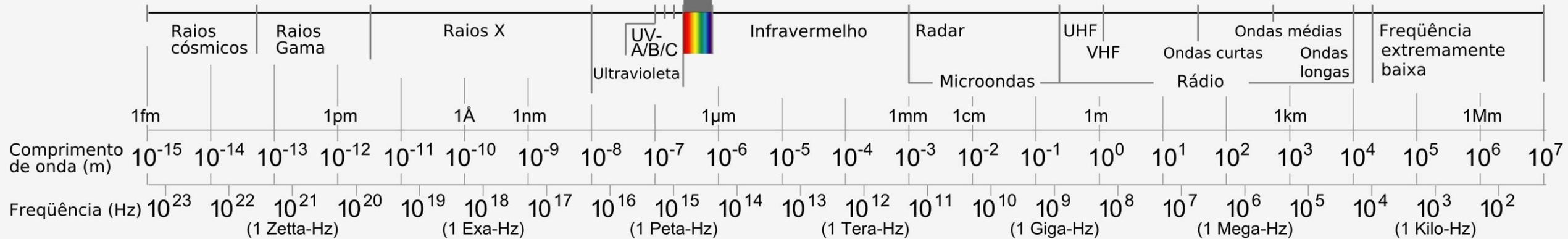
- De Sitter(1917)

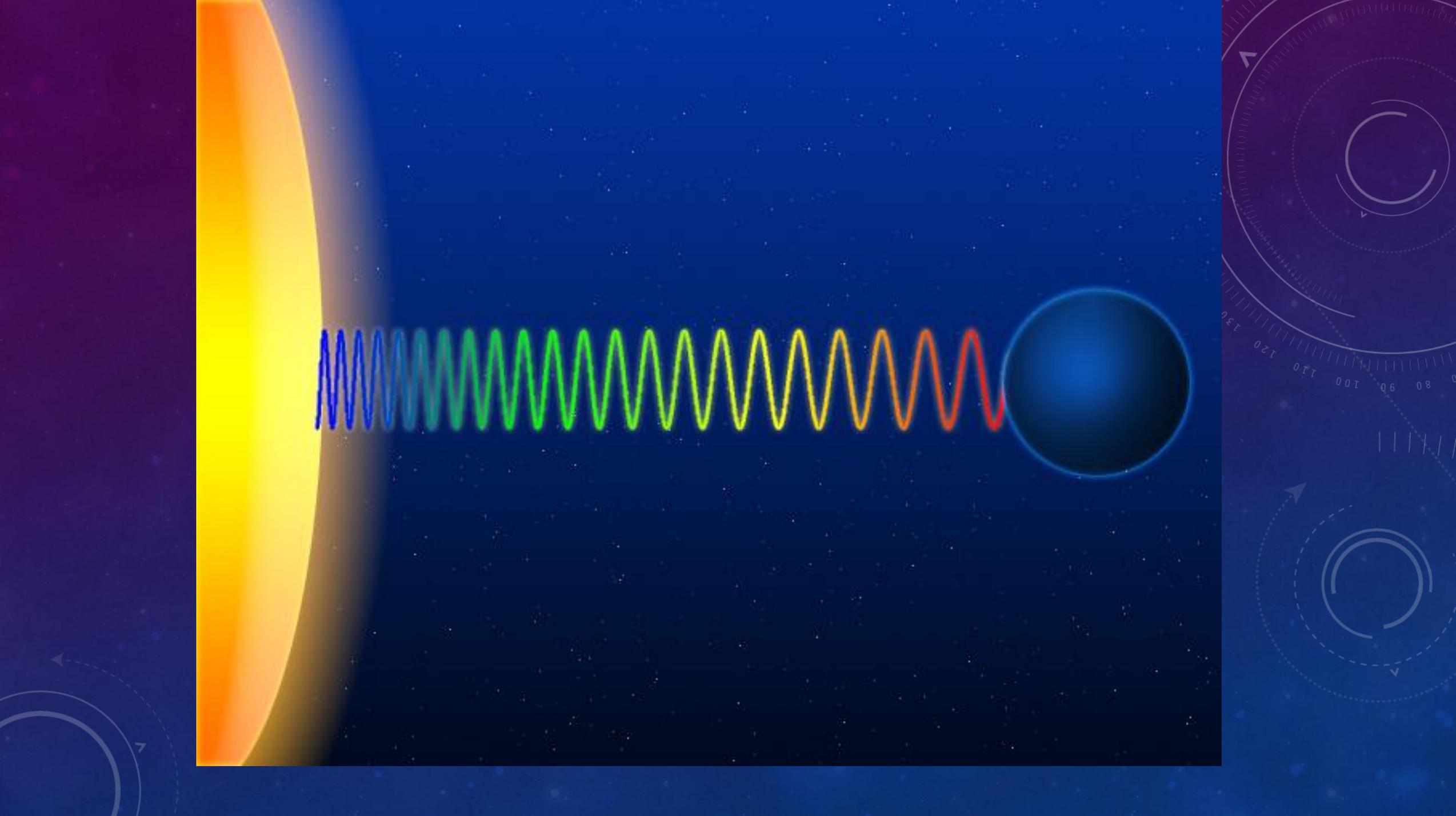


- Vesto Slipher (1922)

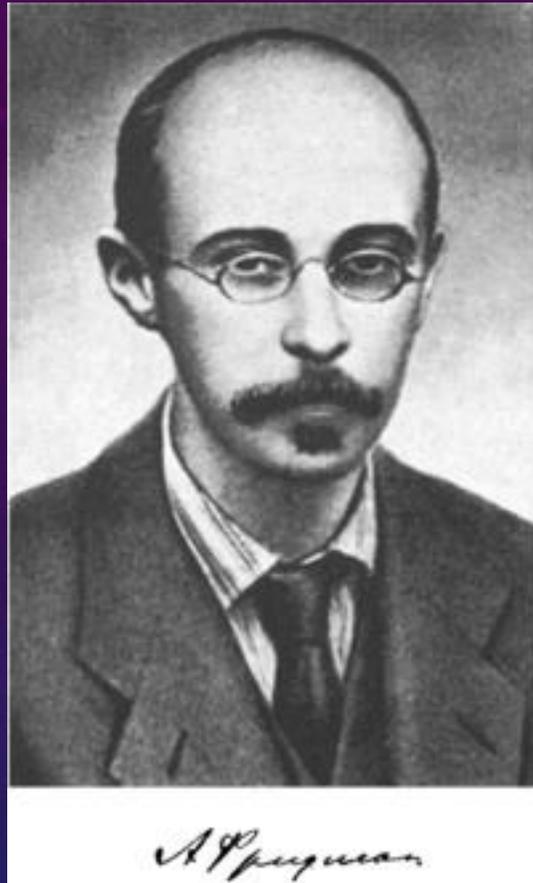


Espectro visível ao Homem

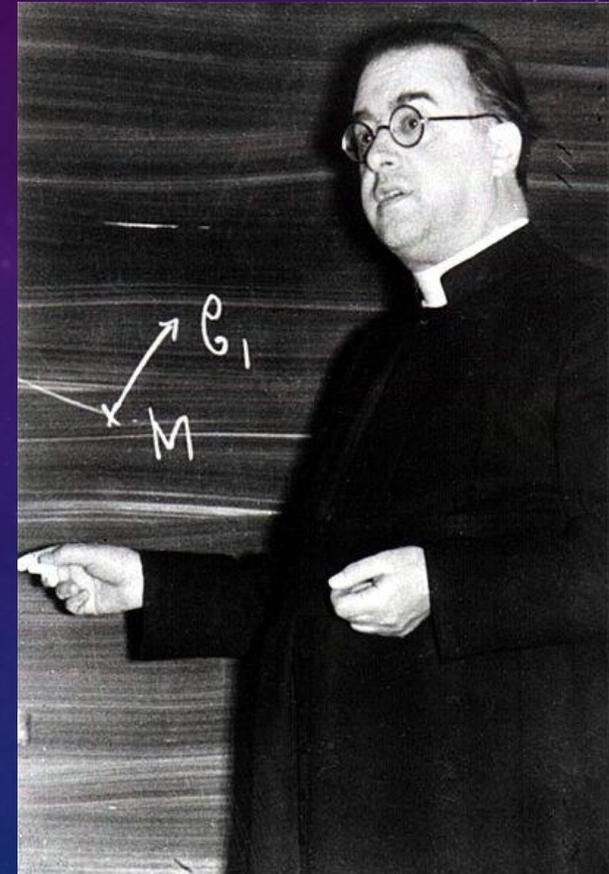




- Friedmann (1922)



- George Lemaitre (1927)



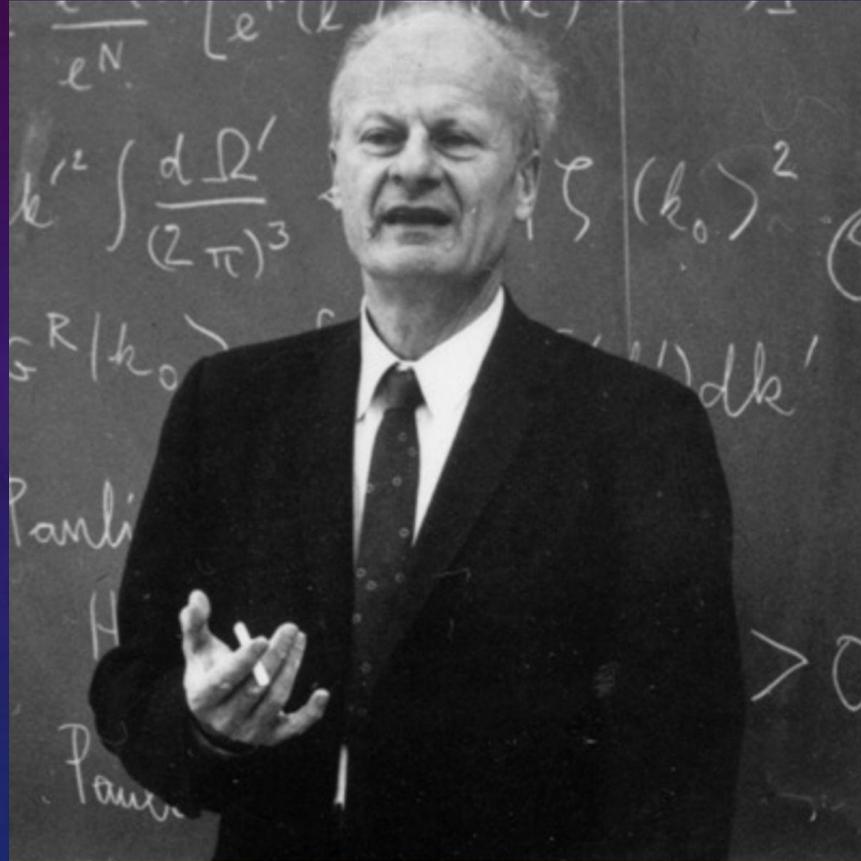
- Edwin Hubble (1929)



- 1948:
- Ralph Alpher

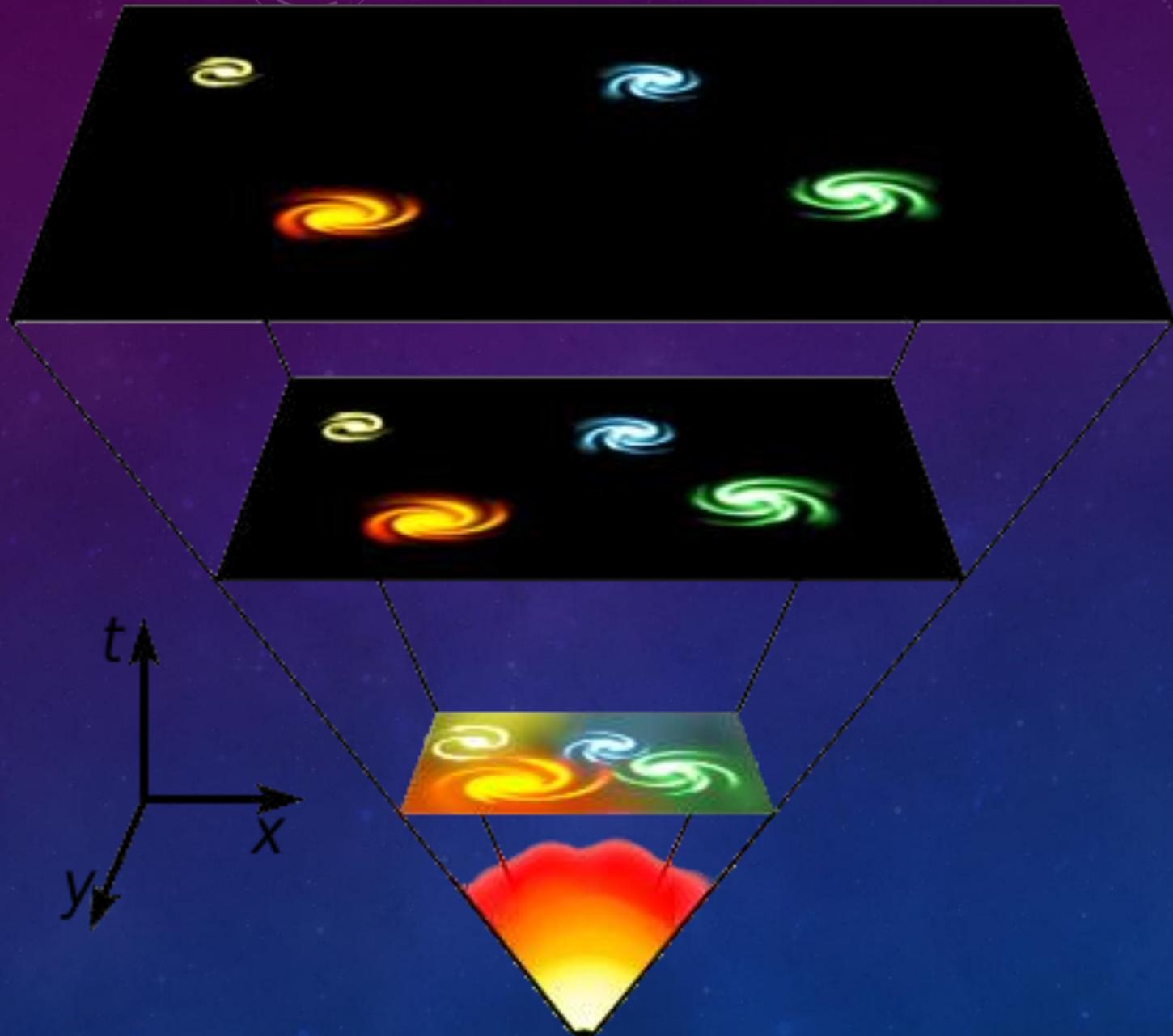


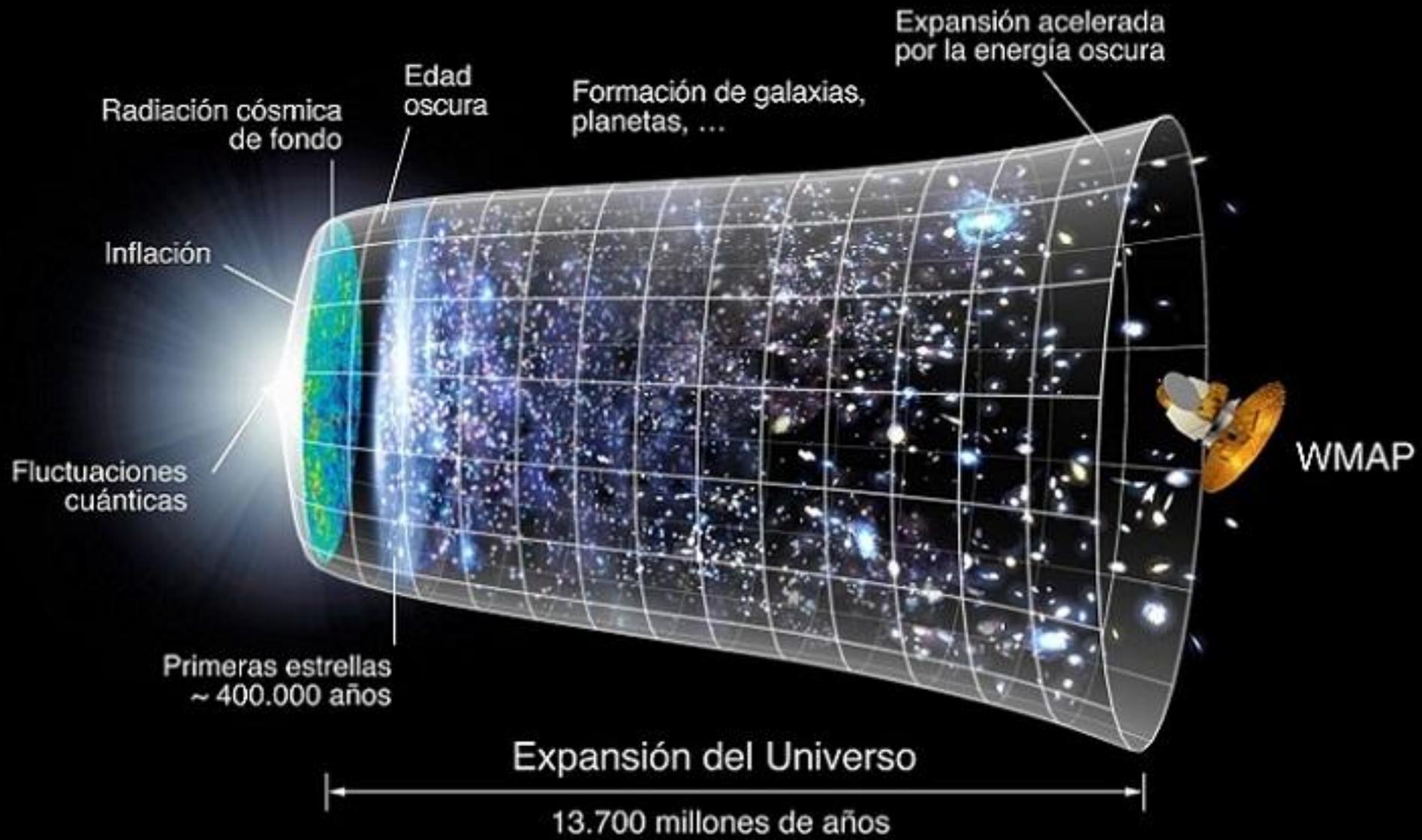
- Hans Bethe



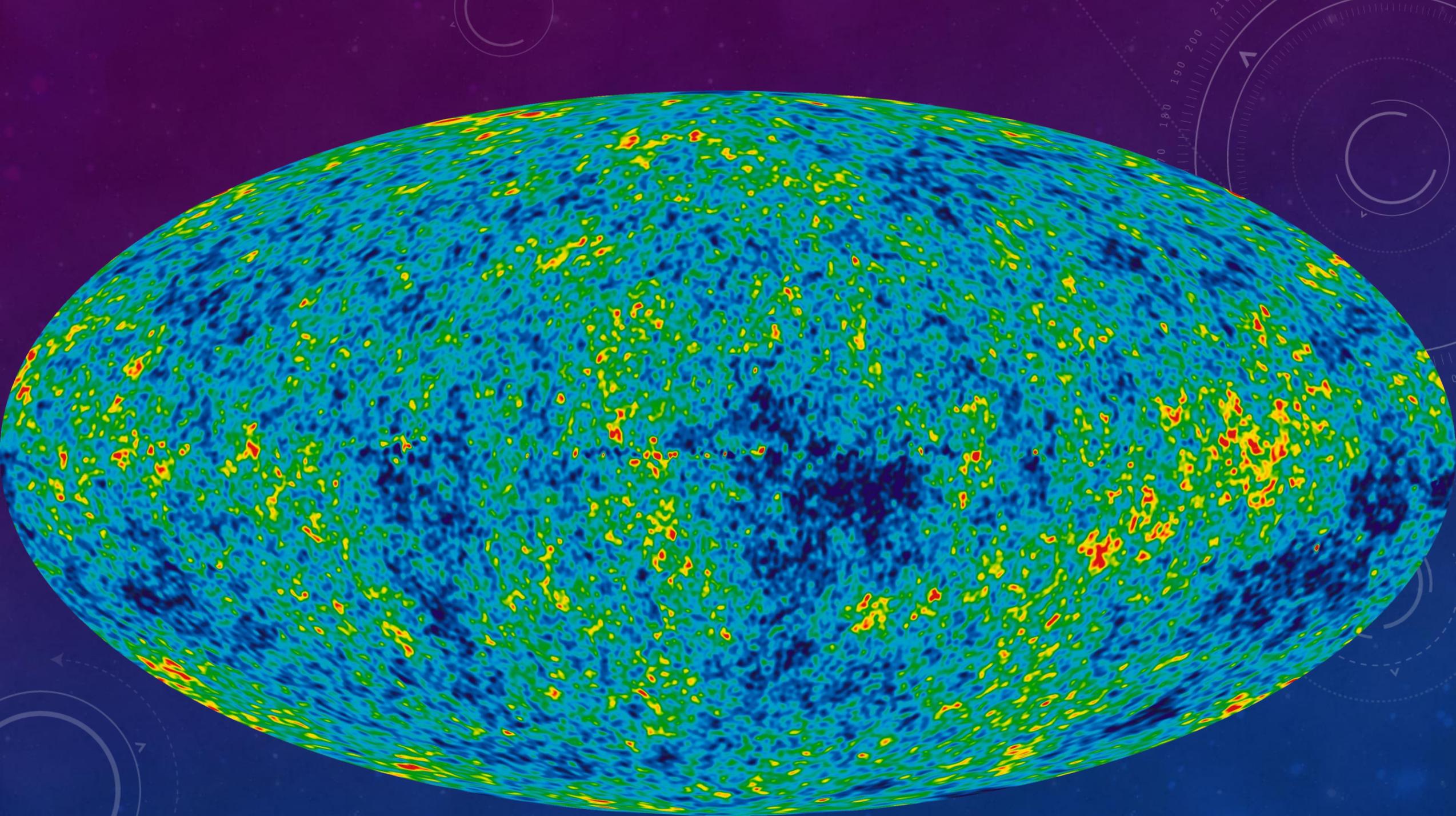
- George Gamow







Cronología de la Expansión del Universo



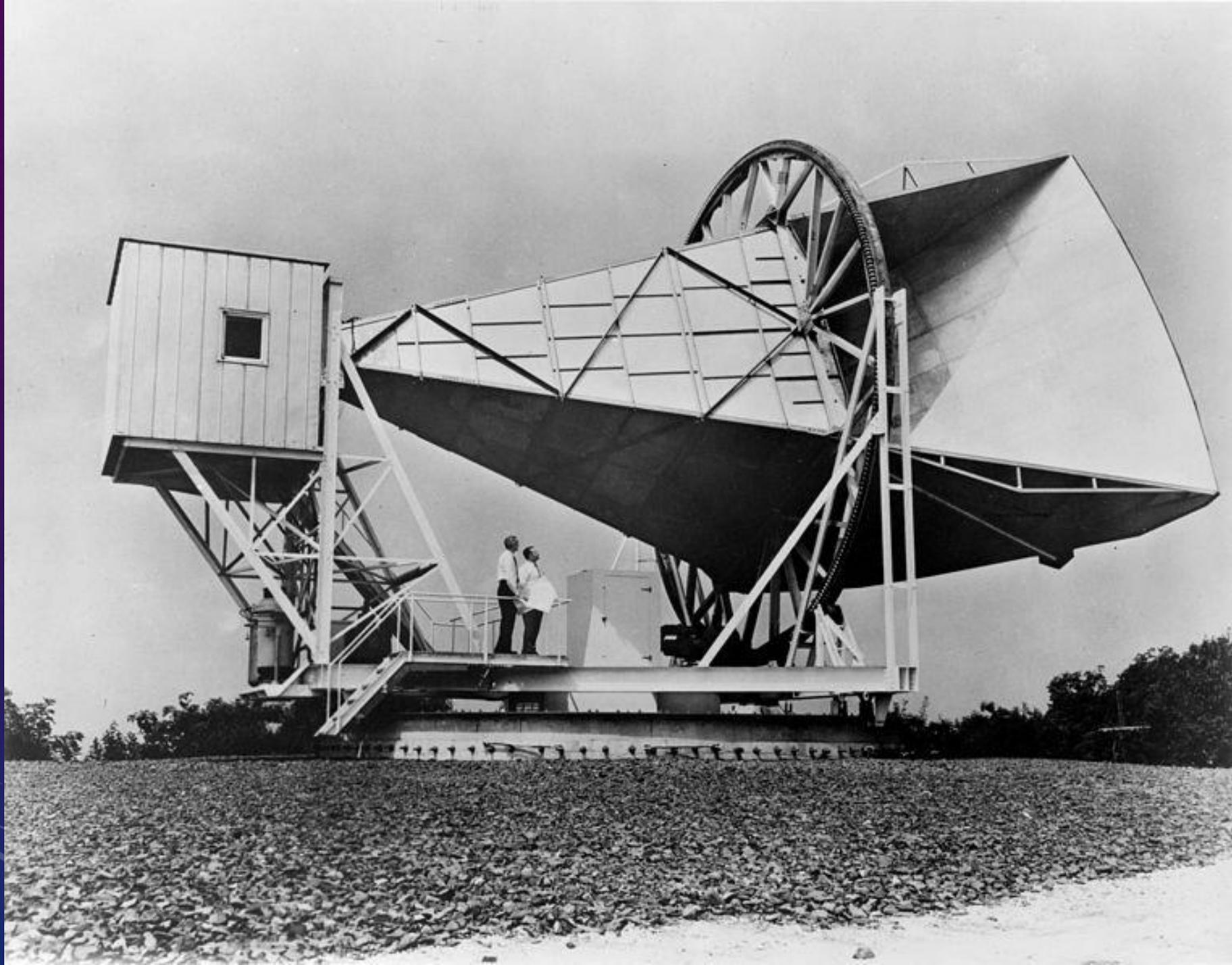
- 1965

- Arno Penzias



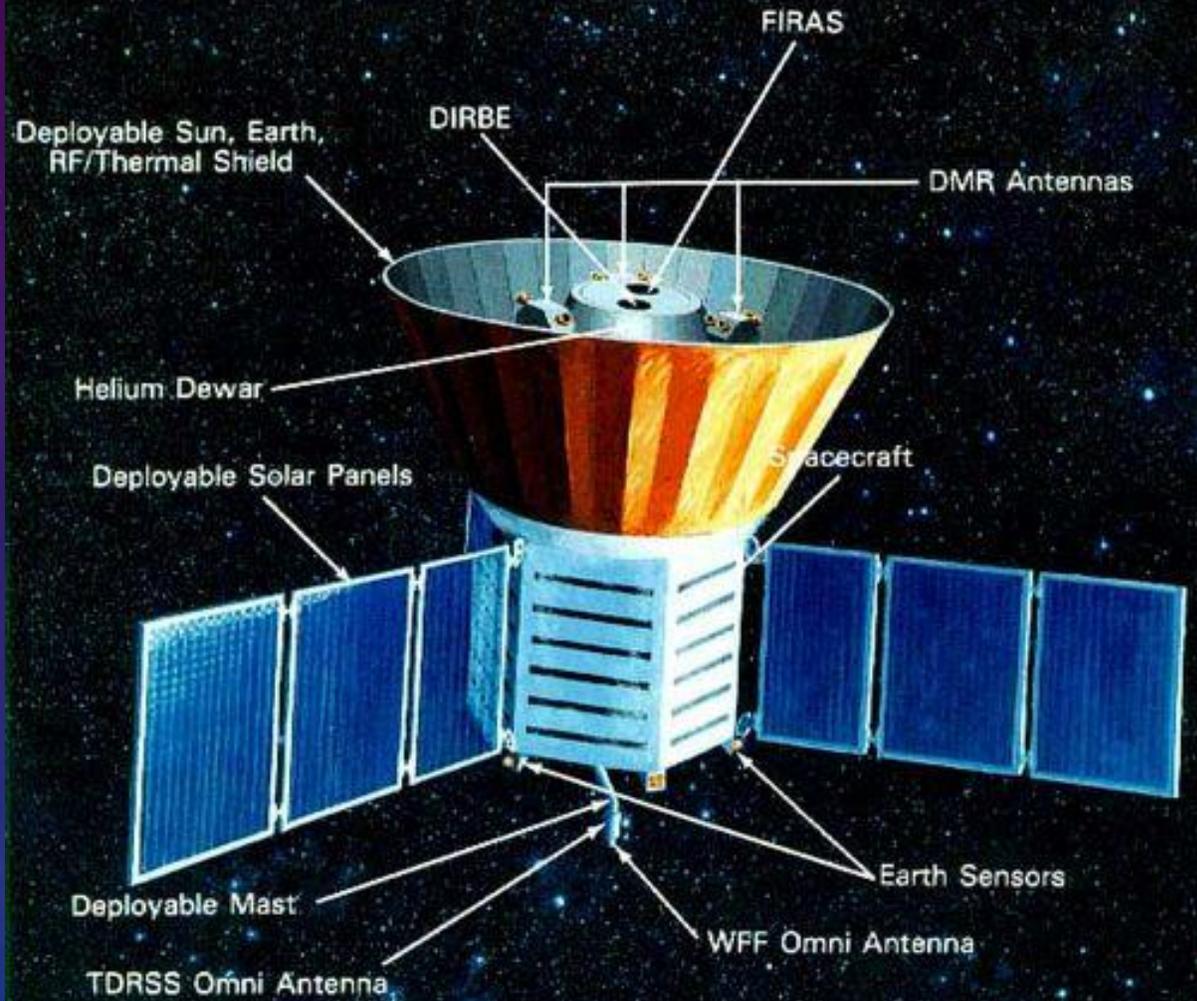
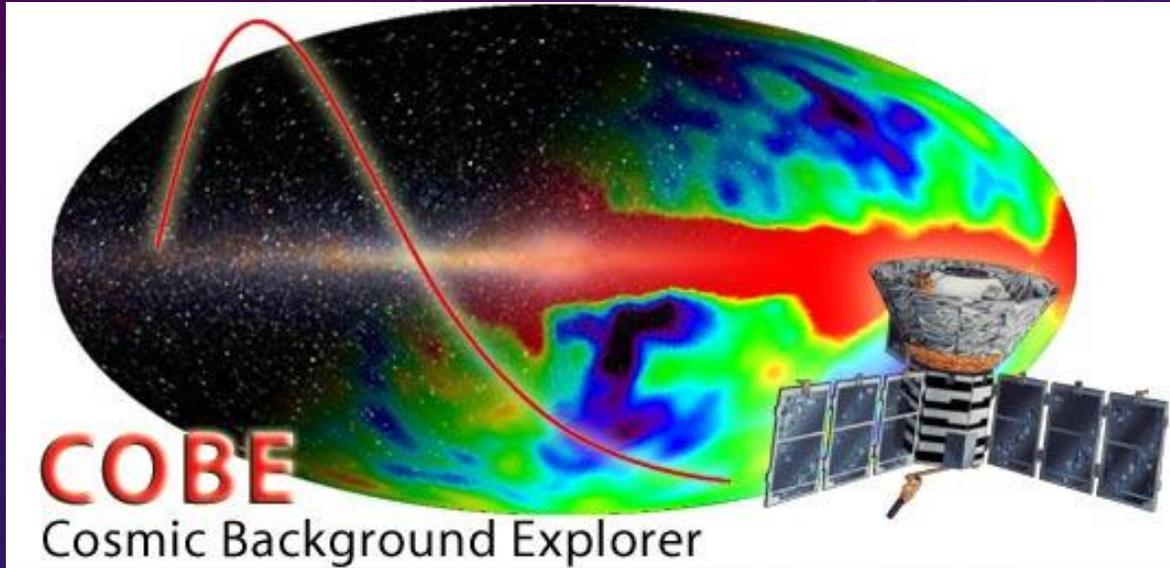
- Robert Wilson



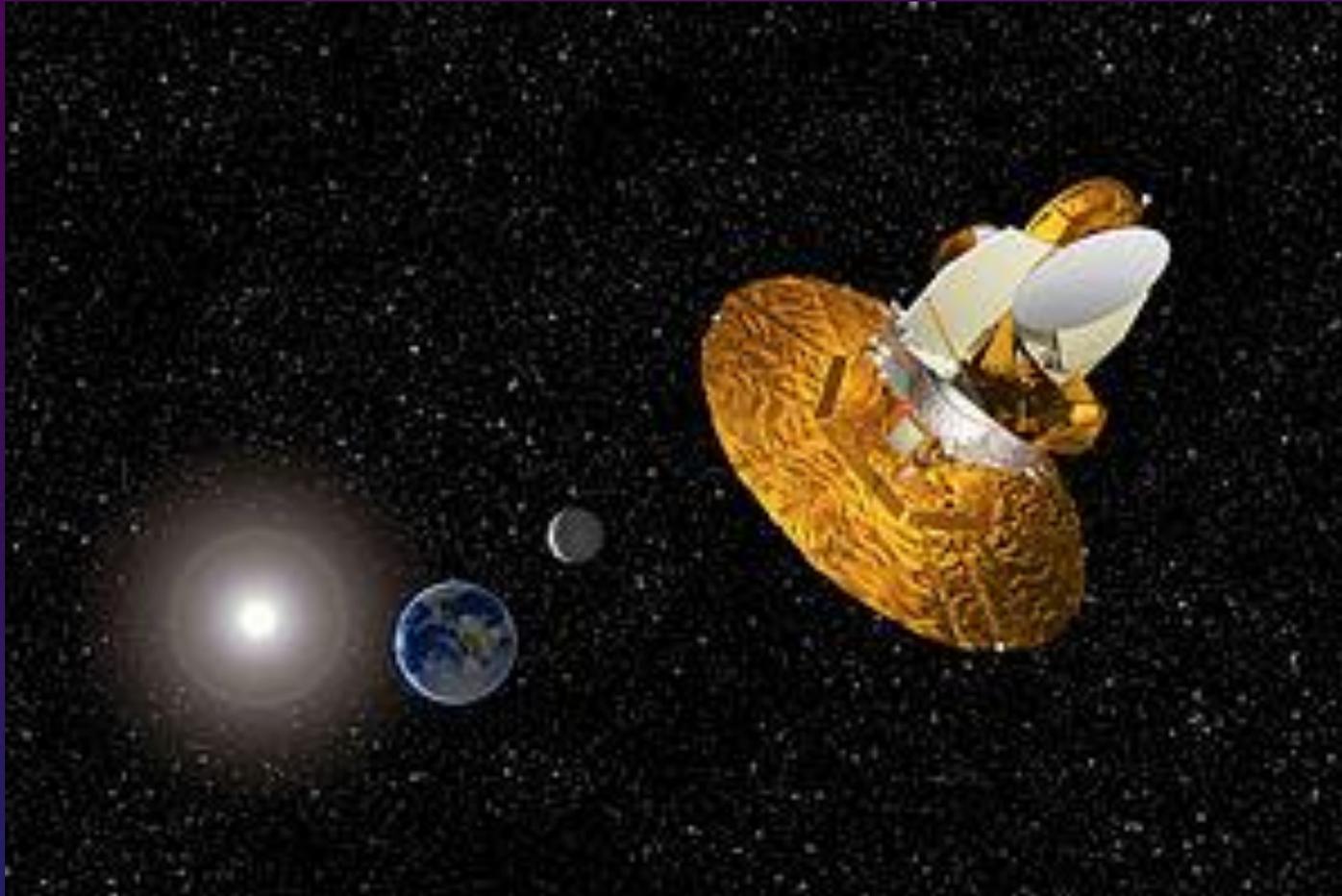


radiotelescópio

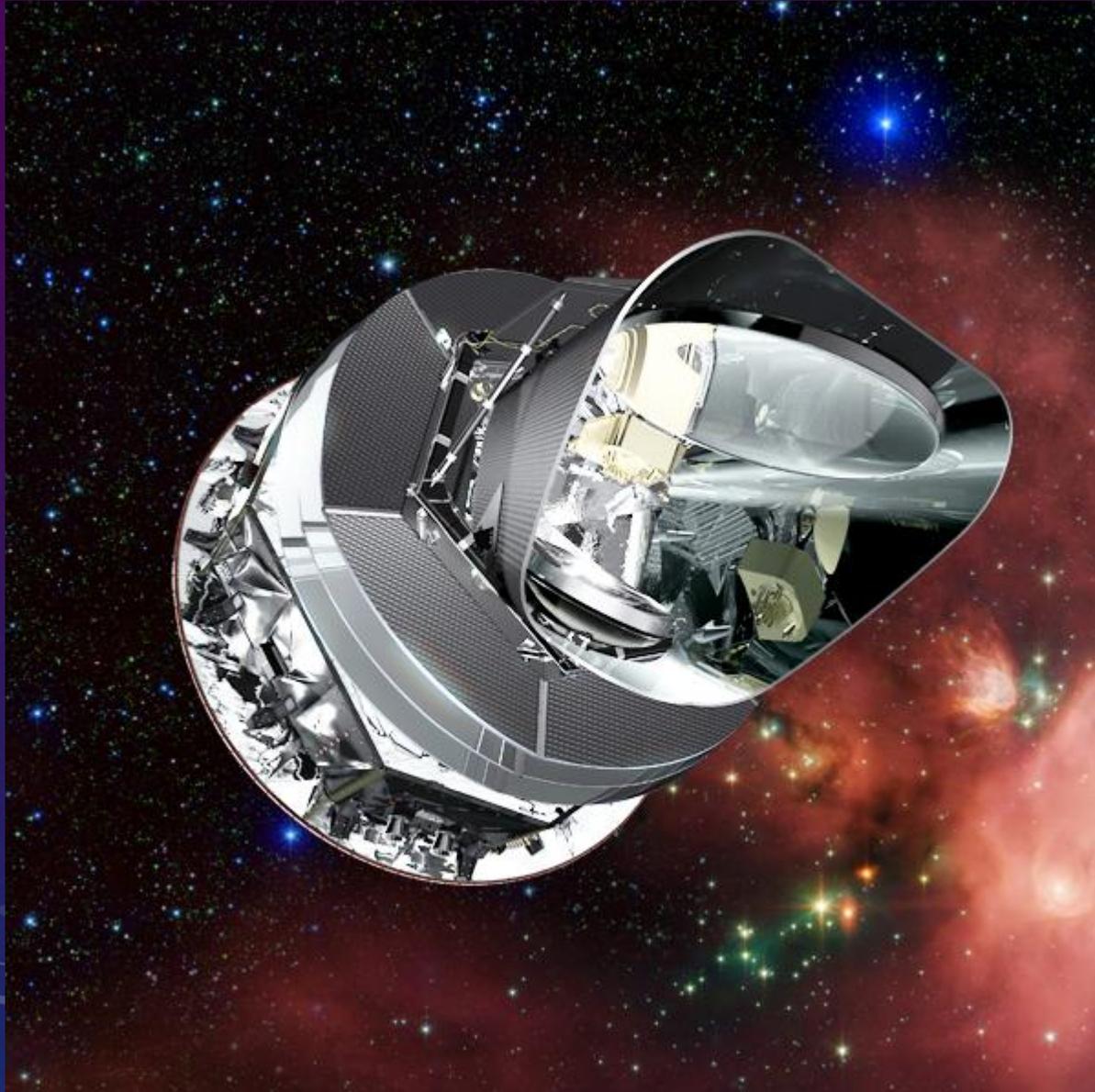
- COBE (1989-1993)



- Wilkinson Microwave Anisotropy Probe(WMAP) (2001-2010)

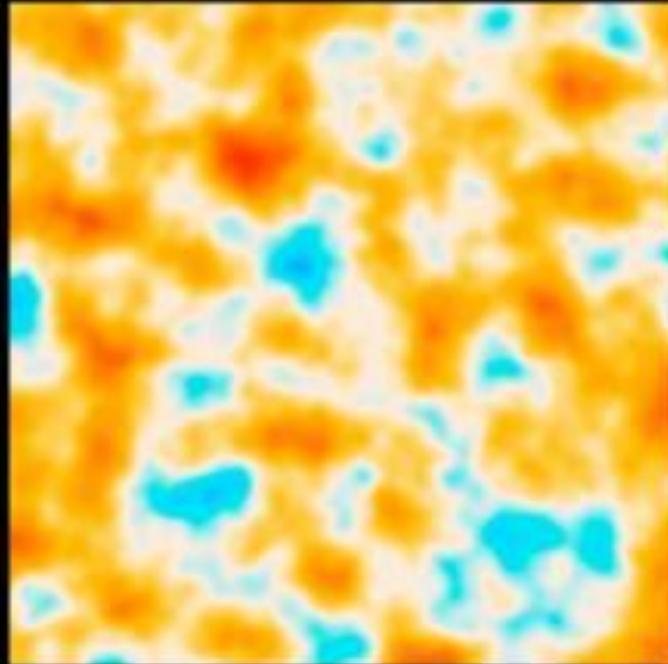
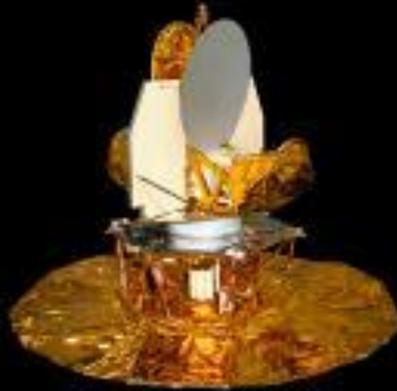


- Planck (2009-2011)

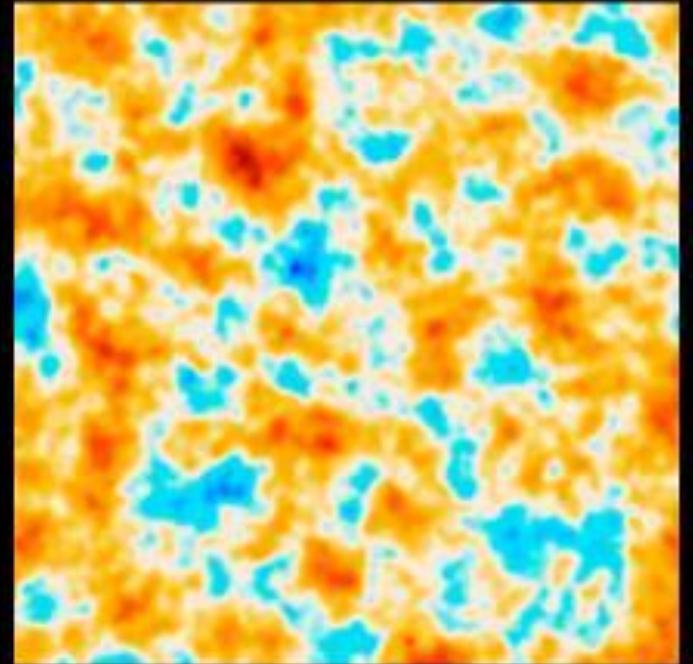
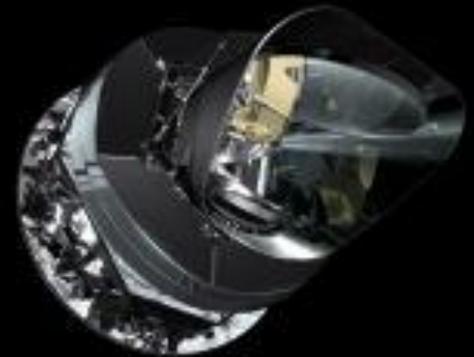




COBE



WMAP



Planck

- “Em algum lugar, alguma coisa incrível está esperando para ser conhecida.” — Carl Sagan

REFÊRENCIAS:

- Wikipedia
- Ciências e Tecnologias
- NASA