

# Física do Universo

A diagram illustrating the evolution of the universe. On the left, a dense, tangled mass of purple and yellow filaments represents the early universe. A bright yellow and orange lens-shaped region in the center represents the Big Bang. On the right, a dark space filled with numerous galaxies of various colors (blue, white, yellow) represents the current universe.

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LIneA

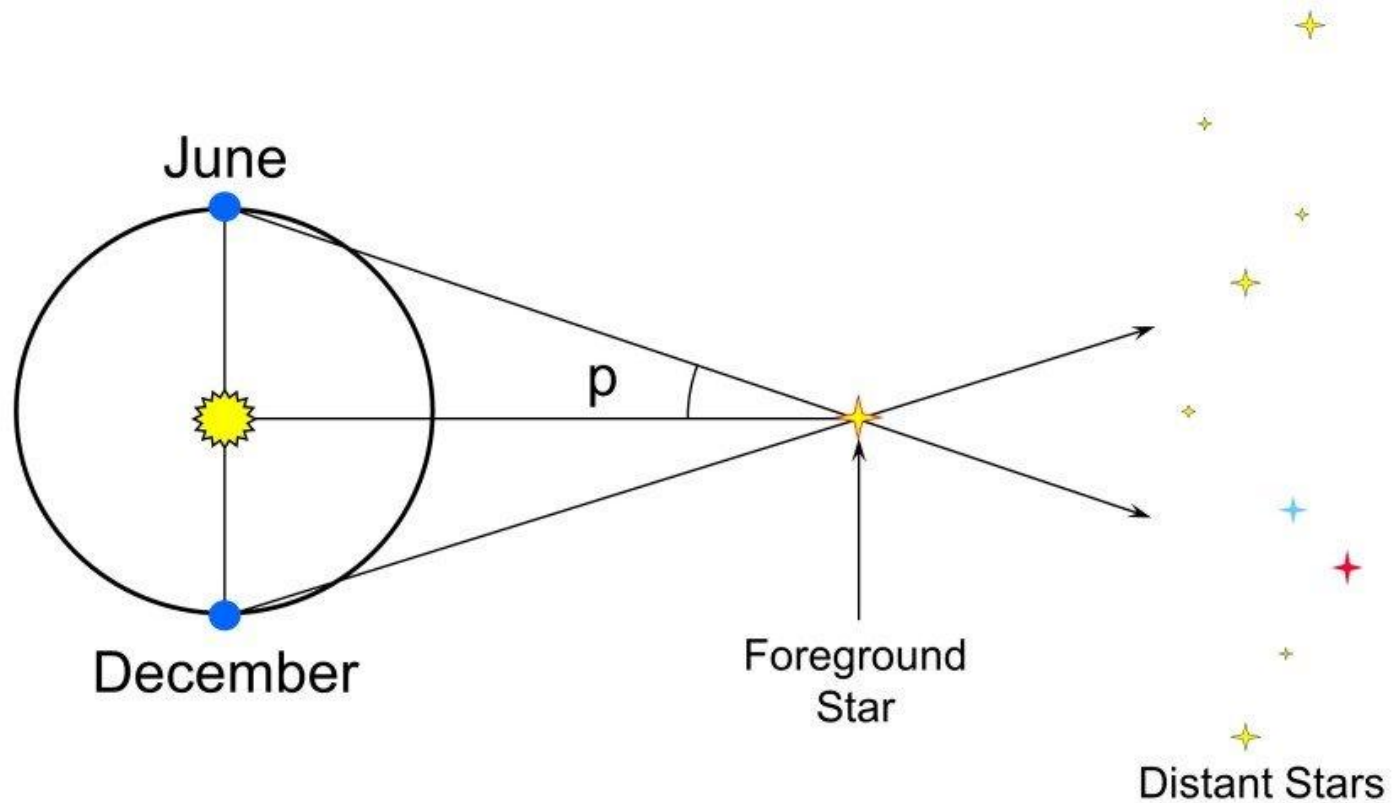
Ensino Médio – 2018

2a aula – 14/04

# Medindo distâncias no Universo

## O método da Paralaxe

# Method of Trigonometric Parallaxes

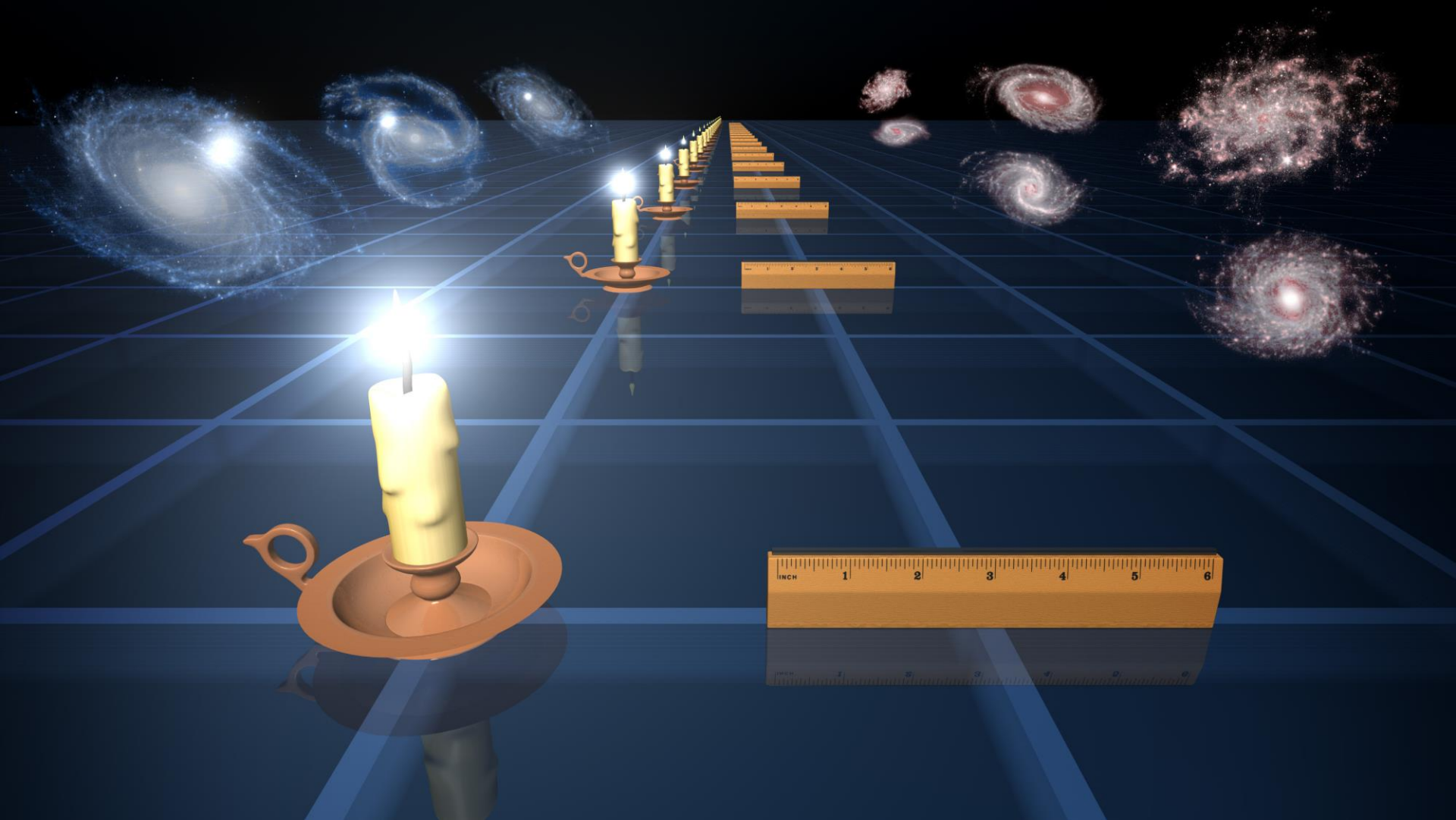


# Medindo distâncias no Universo

Há dois principais métodos para se medir distâncias além de paralaxes:

usar objetos com brilho absoluto conhecido (velas-padrão)

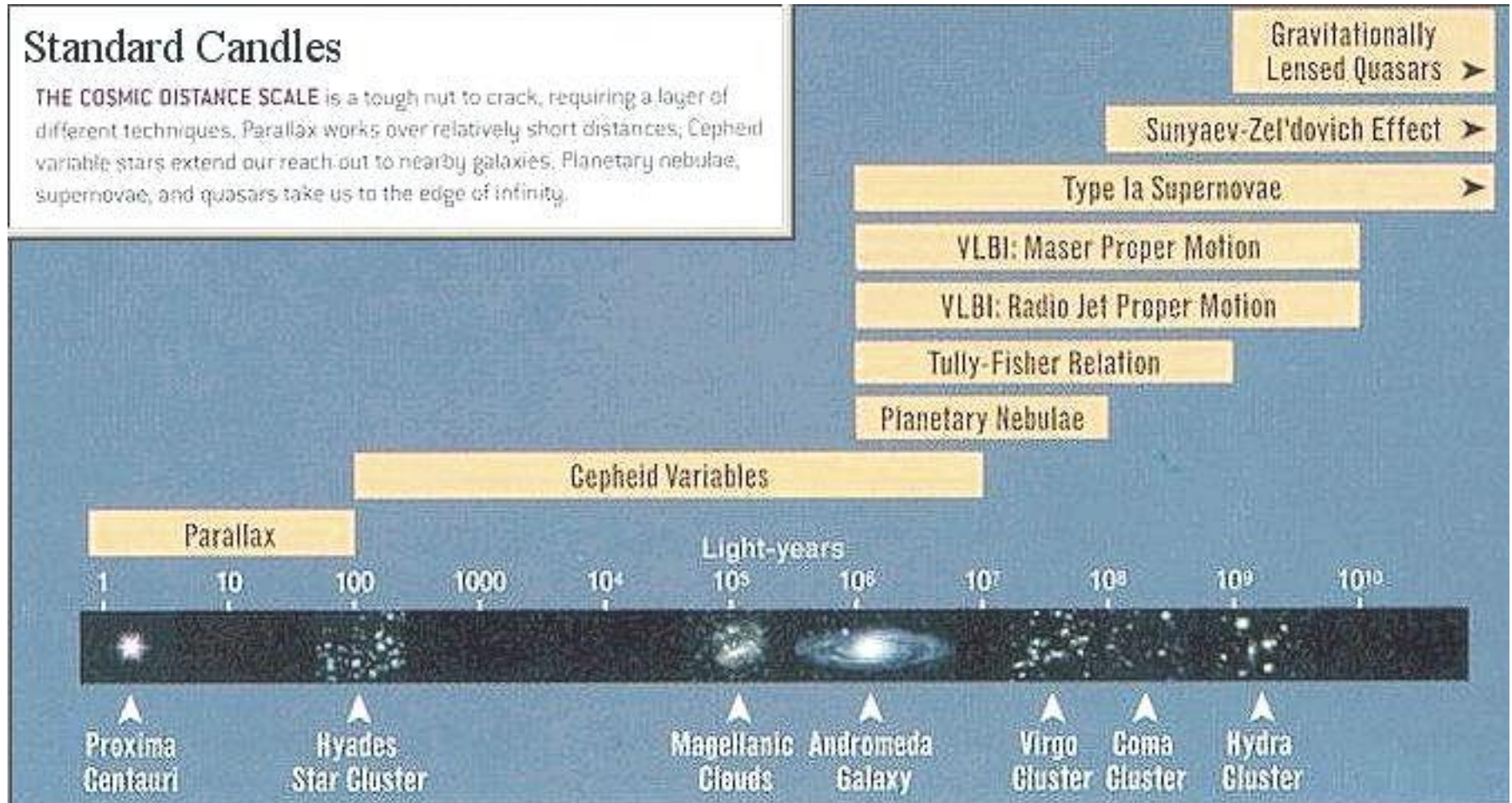
usar objetos com tamanho conhecido (régua padrão)



<https://wigglez.swin.edu.au/site/image1.html>

## Standard Candles

THE COSMIC DISTANCE SCALE is a tough nut to crack, requiring a layer of different techniques. Parallax works over relatively short distances; Cepheid variable stars extend our reach out to nearby galaxies. Planetary nebulae, supernovae, and quasars take us to the edge of infinity.



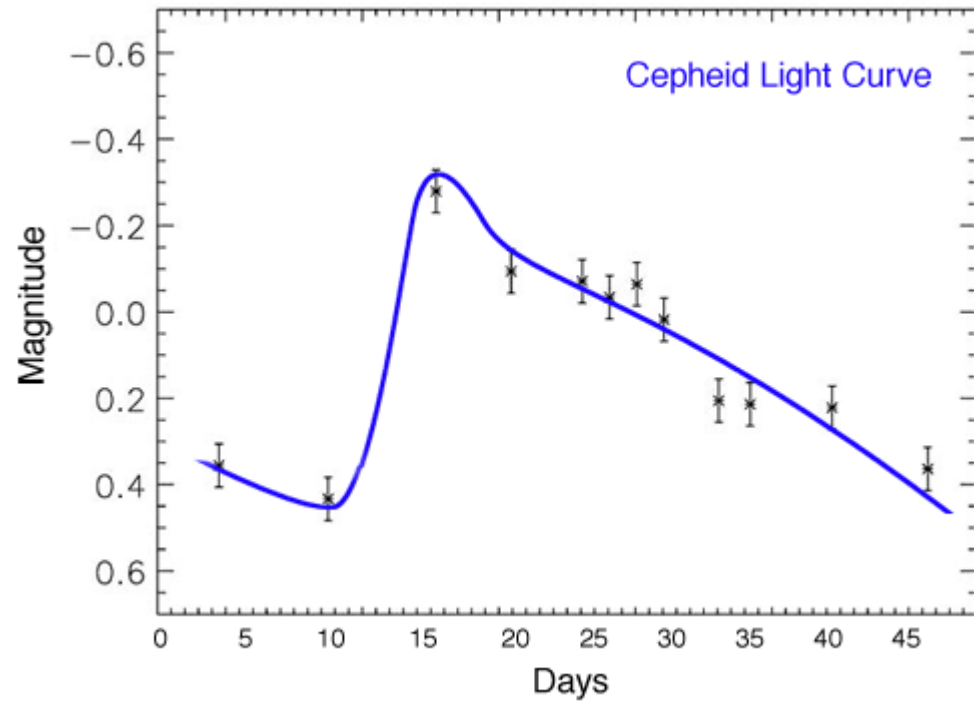
<http://universe-review.ca/I02-14-candles.jpg>

# Estrelas do tipo Cefeidas

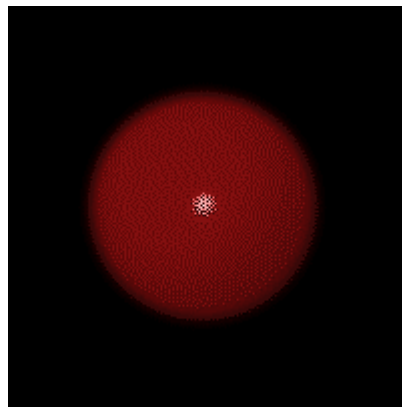
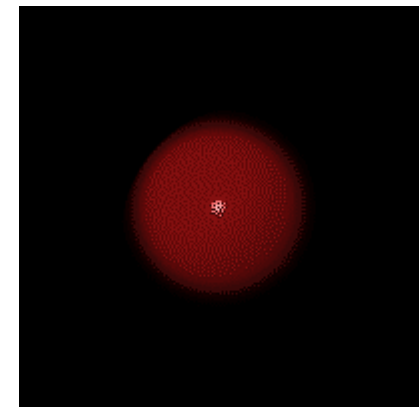
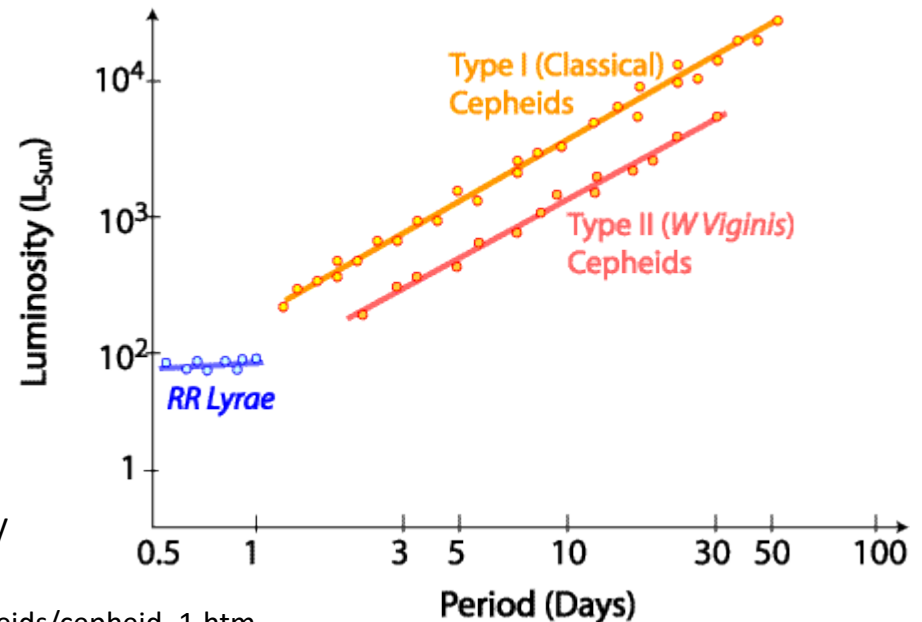
1777 VARIABLES IN THE MAGELLANIC CLOUDS.

BY HENRIETTA S. LEAVITT.

In the spring of 1904, a comparison of two photographs of the Small Magellanic Cloud, taken with the 24-inch Bruce Telescope, led to the discovery of a number of faint variable stars. As the region appeared to be interesting, other plates were examined, and although the quality of most of these was below the usual high standard of excellence of the later plates, 57 new variables were found, and announced in Circular 79. In order to furnish material for determining their periods, a series of sixteen plates, having exposures of from two to four hours, was taken with the Bruce Telescope the following autumn. When they arrived at Cambridge, in January, 1905, a comparison of one of them with an early plate led immediately to the discovery of an extraordinary number of new variable stars. It was found, also, that plates, taken within two or three days of each other, could be compared with equally interesting results, showing that the periods of many of the variables



## PERIOD - LUMINOSITY RELATIONSHIP



Small cepheids pulsate rapidly Large cepheids pulsate slowly