LA PERCEZIONE DEL FINITO

Gianluca Rinaldi

24/01/2025

Associazione Astrofili del Rubicone (A.A.R.)

PARTE I

FINITO E INFINITO

FINITO E INFINITO

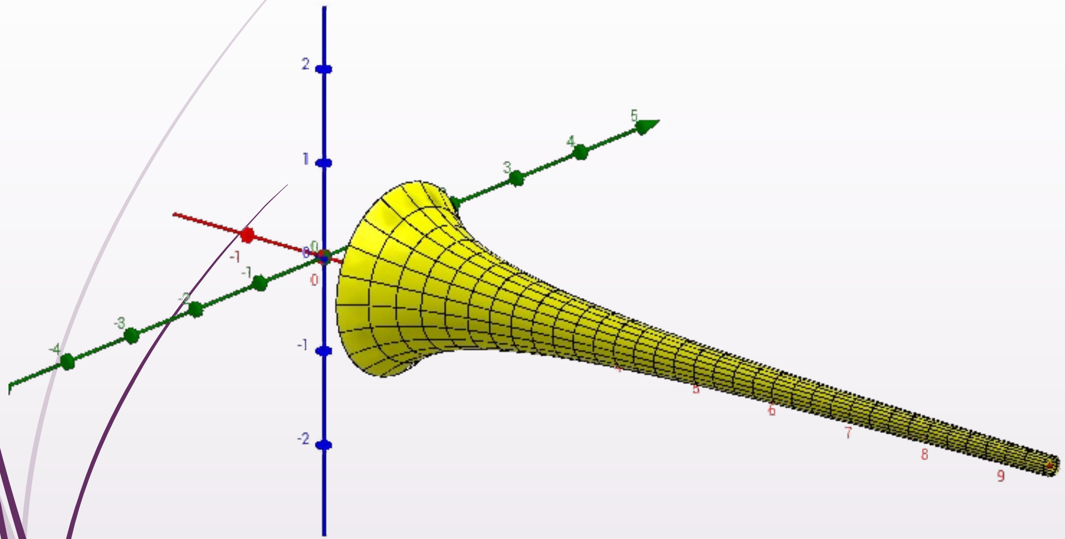

John Wallis (1616-1703)

$$M = 1000$$

$$M \to m \to m \to \infty$$

$$M = CI\text{Ɔ} \to \infty$$

FINITO E INFINITO



$$V = \pi \int_1^\infty \frac{1}{x^2} dx = \pi$$

$$A = 2\pi \int_1^\infty \frac{1}{x} \sqrt{1 + \frac{1}{x^4}} dx > 2\pi \int_1^\infty \frac{1}{x} dx = \infty$$

$$\frac{1}{0}$$

INFINITI	INFINITESIMI
ω	ε
∞	$\frac{1}{\infty}$

h

UNITÀ DI PLANCK

Lunghezza di Planck

$$l_P = \sqrt{\frac{\hbar G}{c^3}}$$

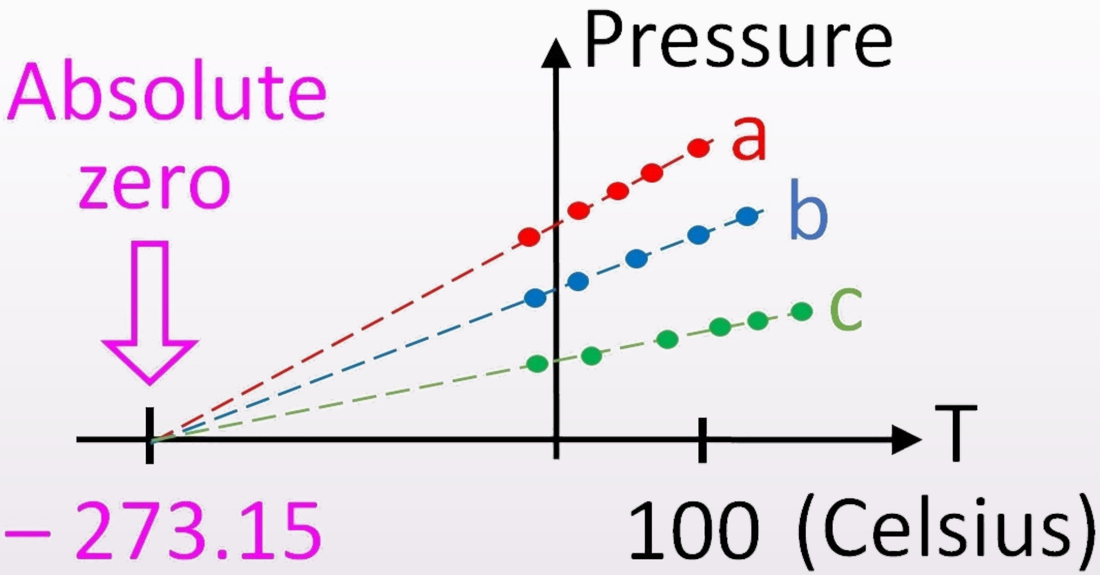
1.616255×10^{-35} m

Tempo di Planck

$$t_P = \sqrt{\frac{\hbar G}{c^5}}$$

5.391247×10^{-44} s

LO ZERO ASSOLUTO



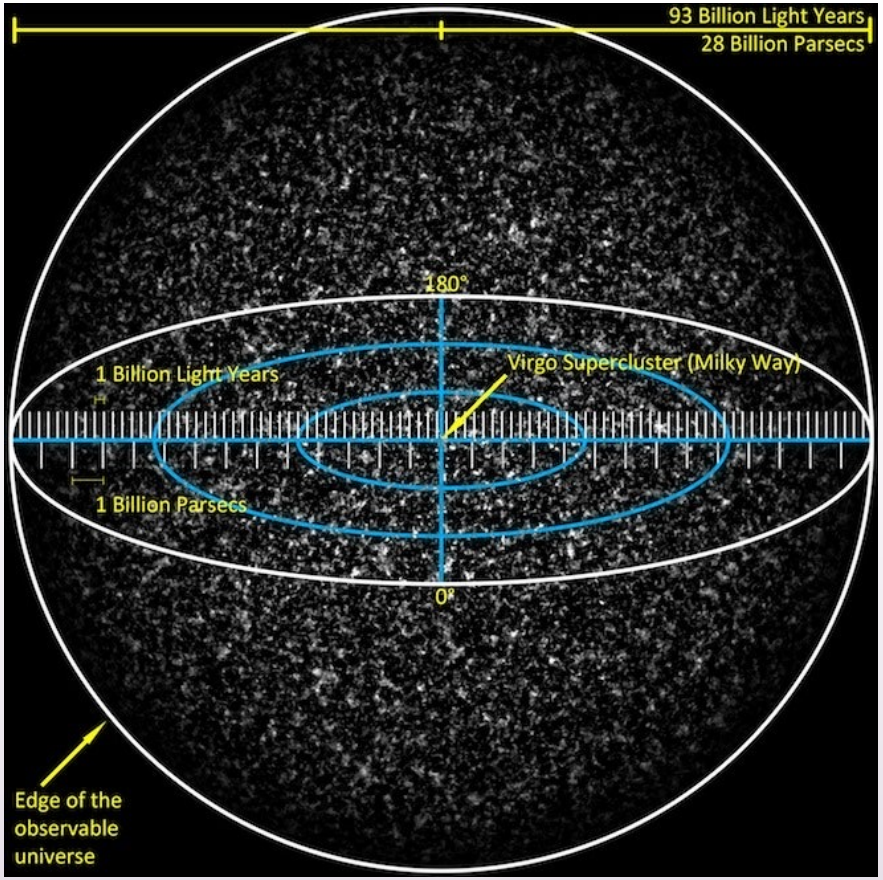
TEMPERATURA DI PLANCK

$$T_P = \sqrt{\frac{\hbar c^5}{G k^2}}$$

1.41679×10^{32} K

L’UNIVERSO È INFINITO?

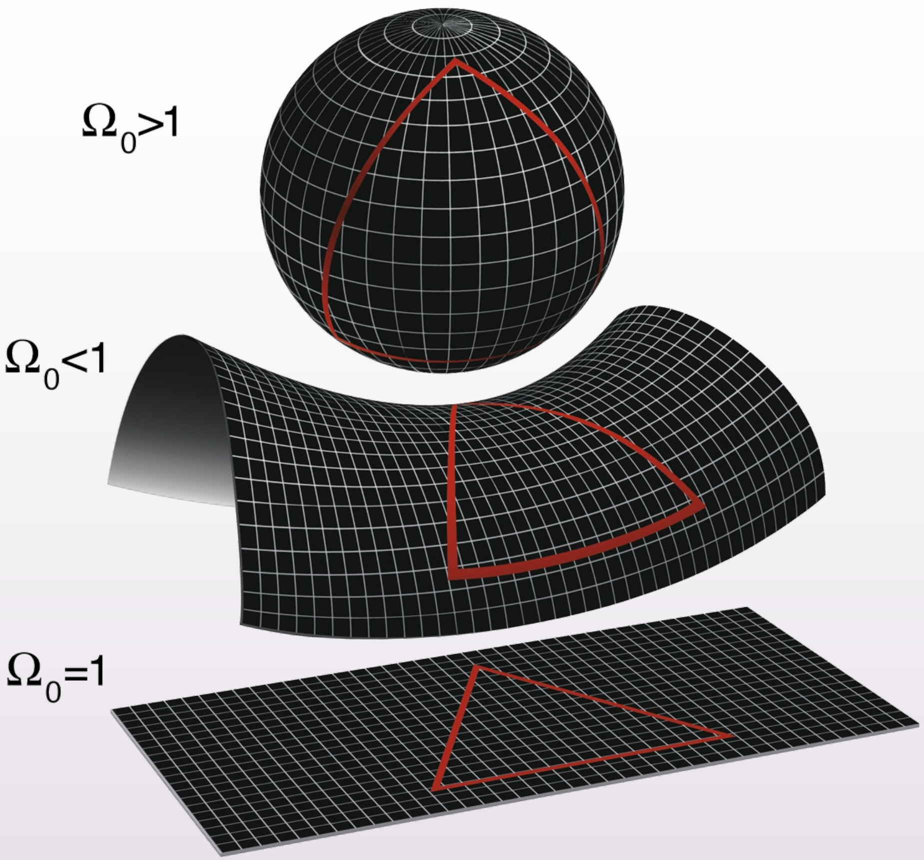
UNIVERSO OSSERVABILE

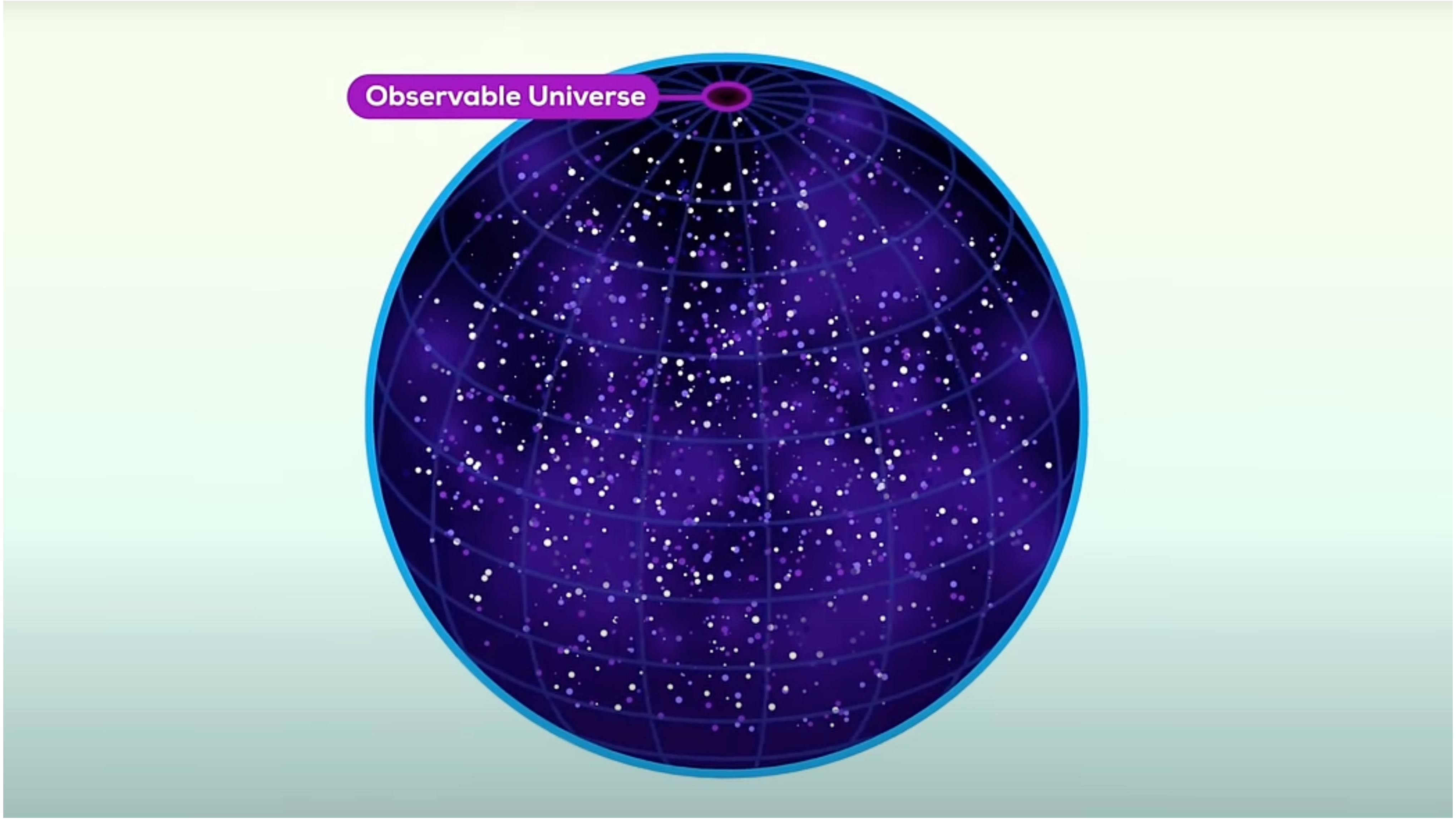


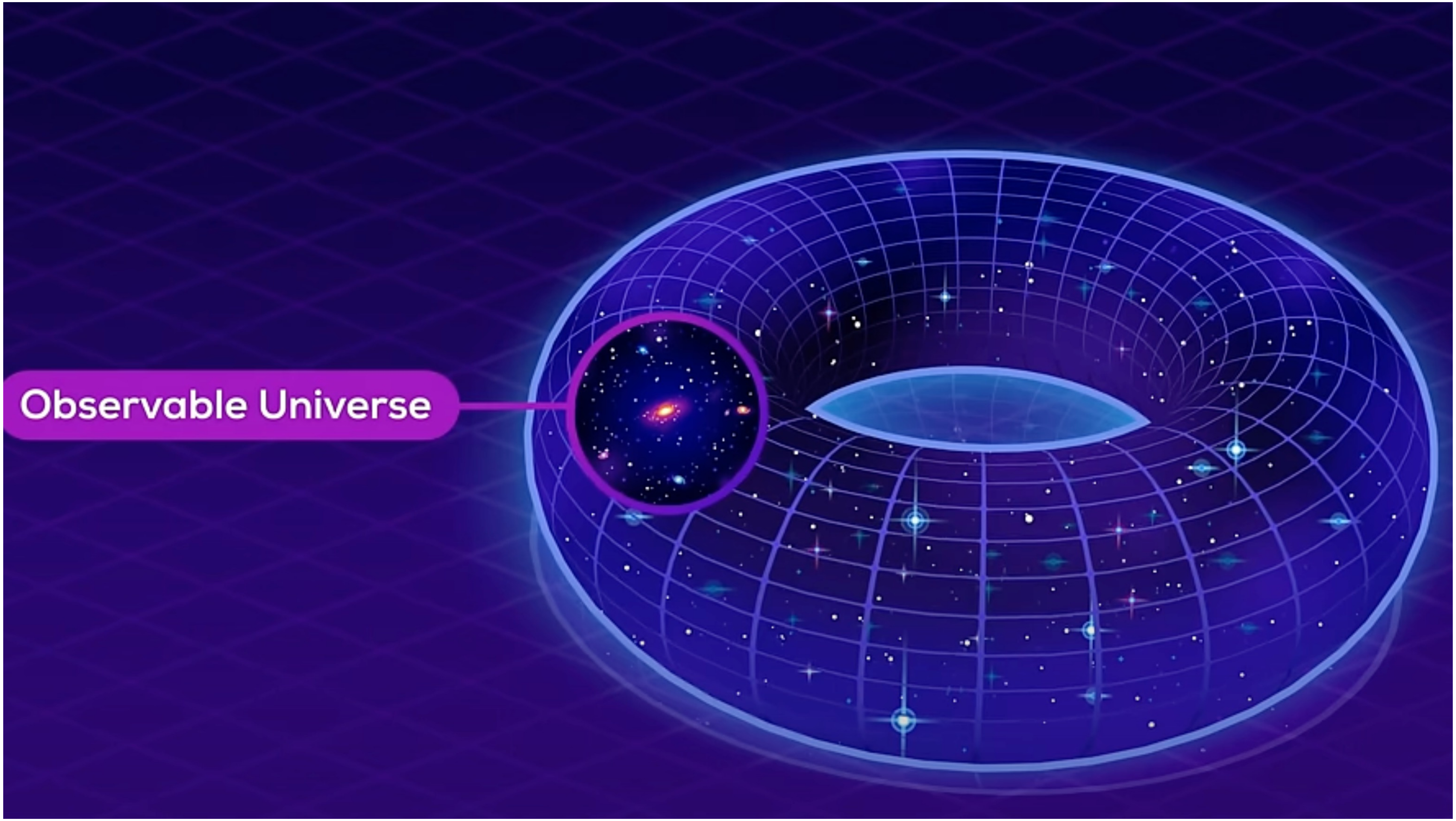
UNIVERSO OSSERVABILE

Il pallone da alta quota utilizzato per portare ad altezza suborbitale il telescopio atto a eseguire il progetto BOOMERanG

GEOMETRIA DELL'UNIVERSO

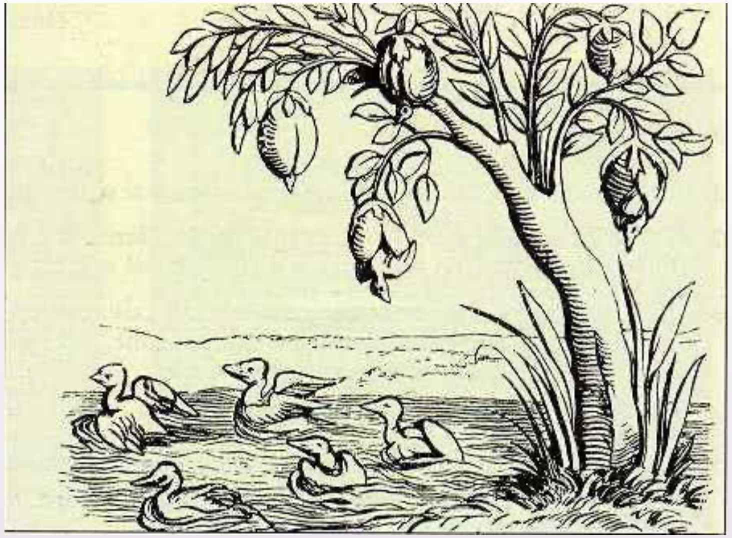



Observable Universe

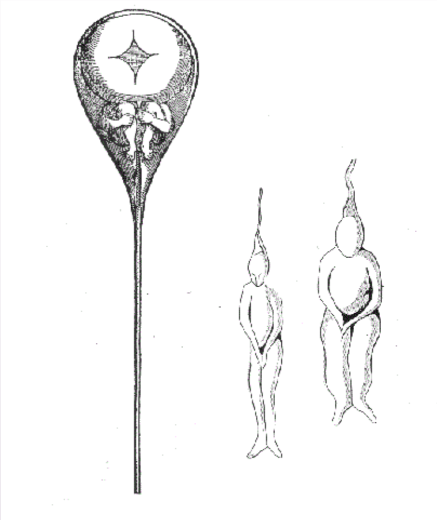

Observable Universe

LA VITA COME LA VEDEVAMO IN PASSATO

Generazione spontanea

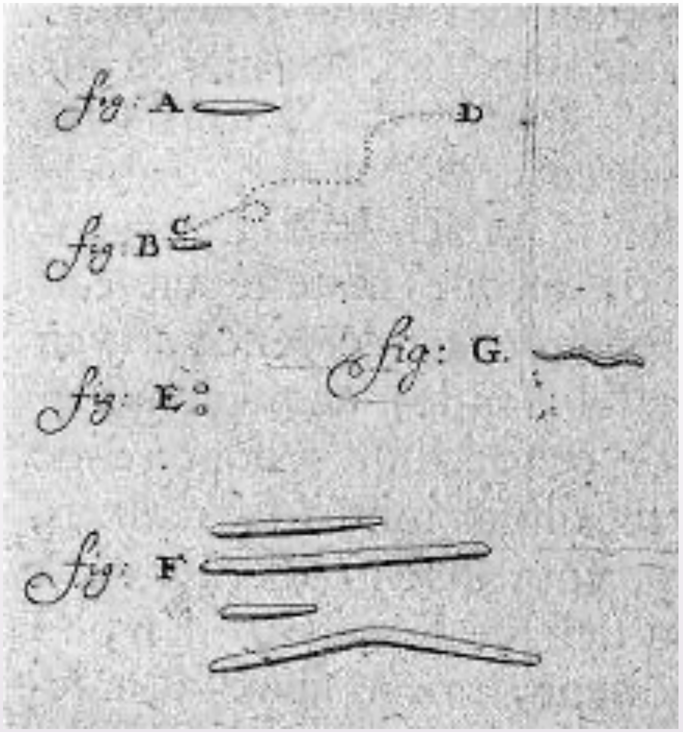


Preformismo

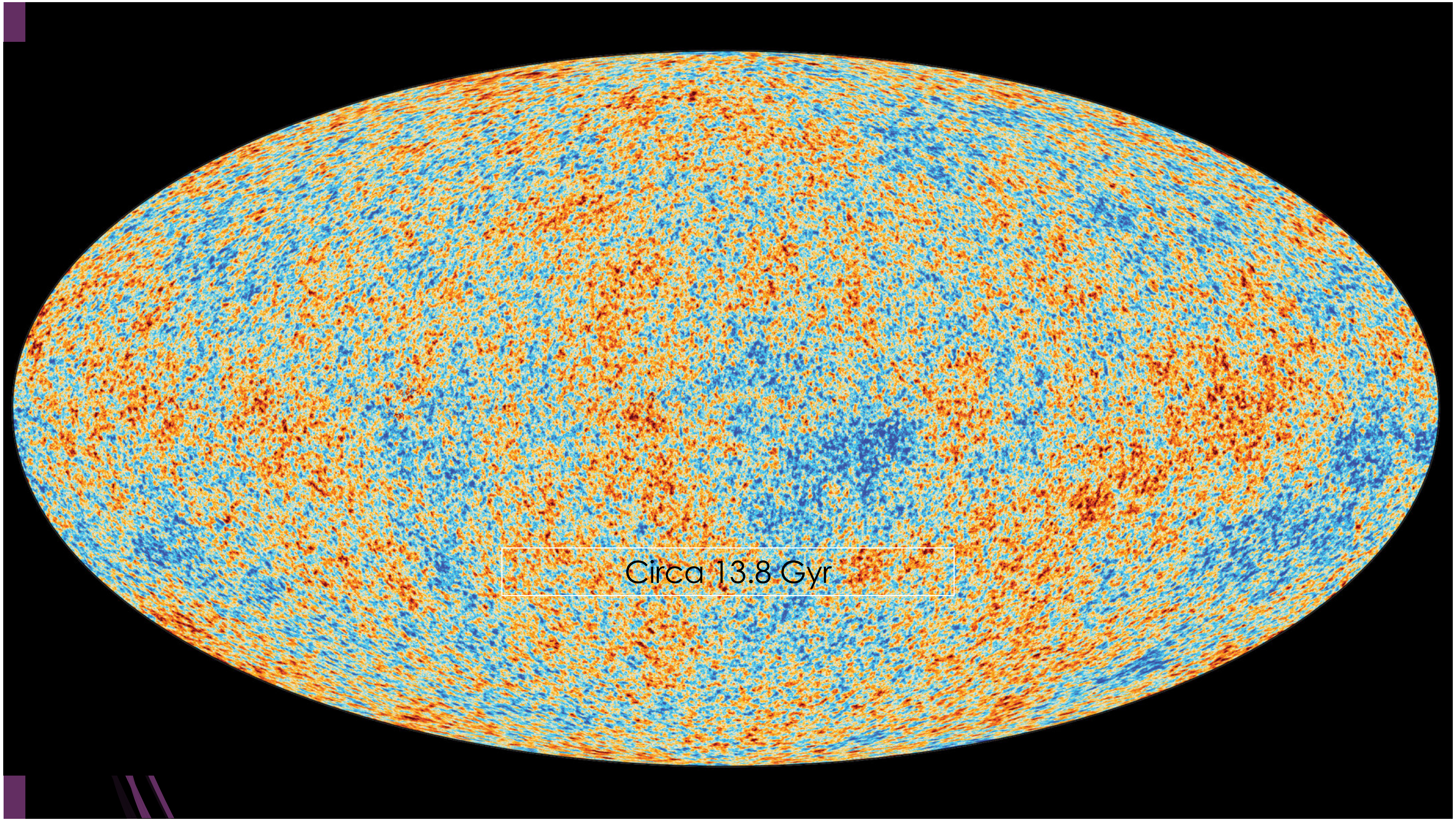


L’AVVENTO DELLA MICROSCOPIA

Antoni van Leeuwenhoek
(1632-17023)



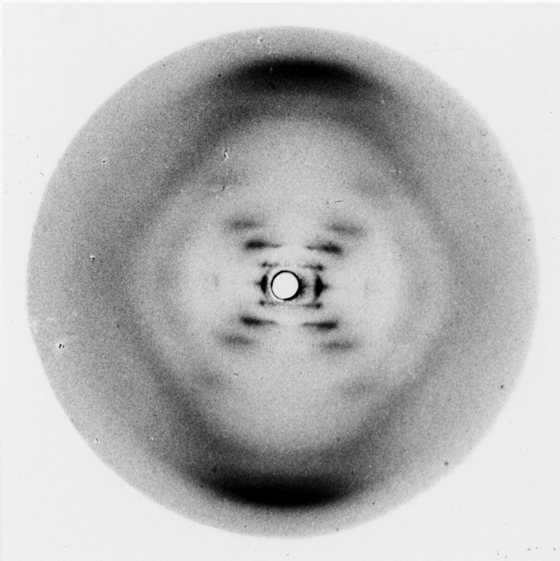
BIOGENESI


Circa 13.8 Gyr

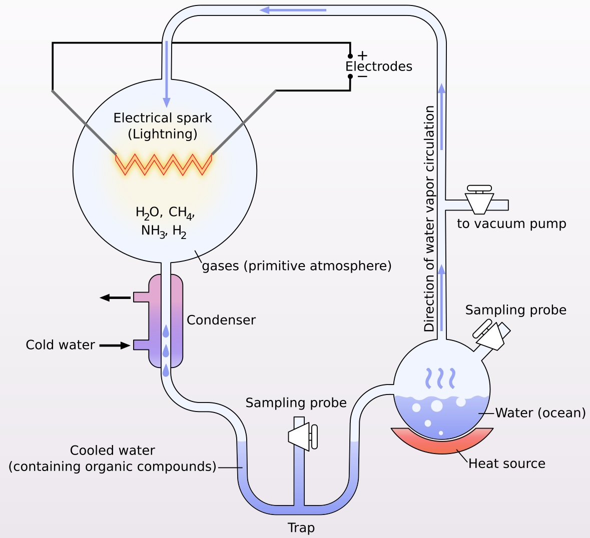
1953

1953

Struttura DNA



Esperimento di Miller-Urey



PARTE II

RITORNO AL PASSATO

[Submitted on 28 Mar 2013]

Life Before Earth

Alexei A. Sharov, Richard Gordon

An extrapolation of the genetic complexity of organisms to earlier times suggests that life began before the Earth was formed. Life may have started from systems with single heritable elements that are functionally equivalent to a nucleotide. The genetic complexity, roughly measured by the number of non-redundant functional nucleotides, is expected to have grown exponentially due to several positive feedback factors: gene cooperation, duplication of genes with their subsequent specialization, and emergence of novel functional niches associated with existing genes. Linear regression of genetic complexity on a log scale extrapolated back to just one base pair suggests the time of the origin of life 9.7 billion years ago. This cosmic time scale for the evolution of life has important consequences: life took ca. 5 billion years to reach the complexity of bacteria; the environments in which life originated and evolved to the prokaryote stage may have been quite different from those envisaged on Earth; there was no intelligent life in our universe prior to the origin of Earth, thus Earth could not have been deliberately seeded with life by intelligent aliens; Earth was seeded by panspermia; experimental replication of the origin of life from scratch may have to emulate many cumulative rare events; and the Drake equation for guesstimating the number of civilizations in the universe is likely wrong, as intelligent life has just begun appearing in our universe. Evolution of advanced organisms has accelerated via development of additional information-processing systems: epigenetic memory, primitive mind, multicellular brain, language, books, computers, and Internet. As a result the doubling time of complexity has reached ca. 20 years. Finally, we discuss the issue of the predicted technological singularity and give a biosemiotics perspective on the increase of complexity.

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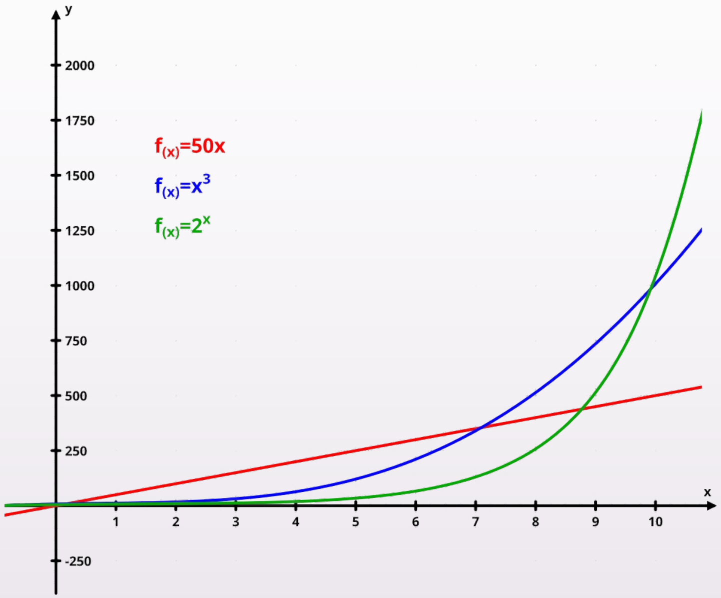
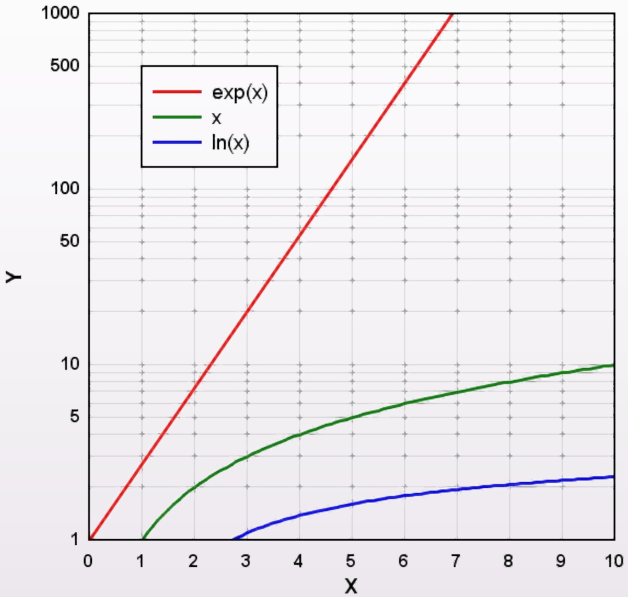
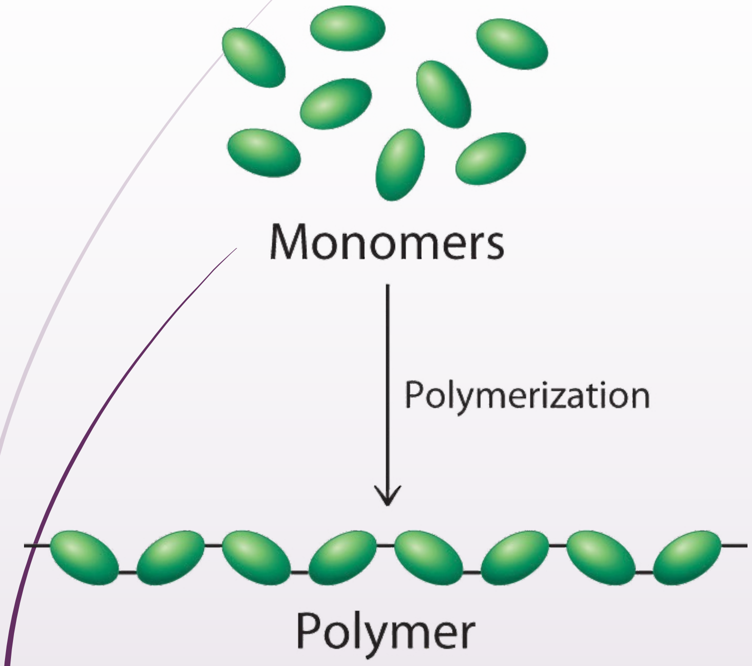
(or arXiv:1304.3381v1 **[physics.gen-ph]** for this version)
https://doi.org/10.48550/arXiv.1304.3381

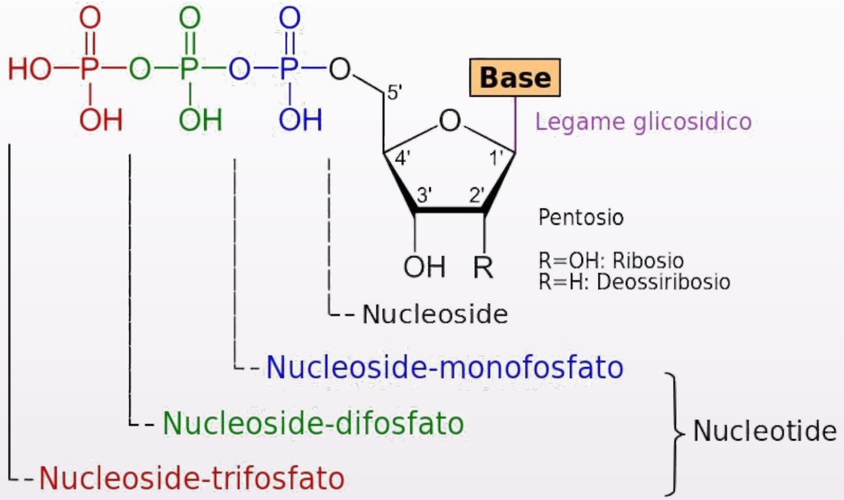
ESPONENZIALI E LOGARITMI



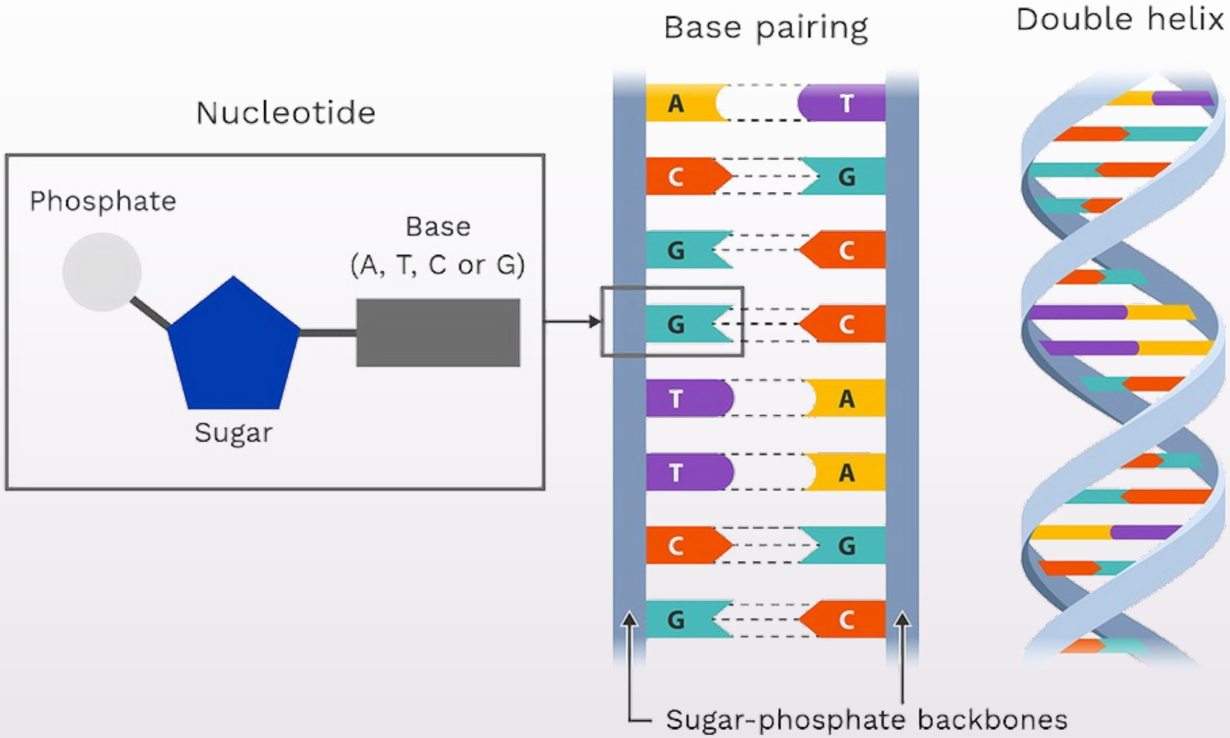


STRUTTURA DEL DNA

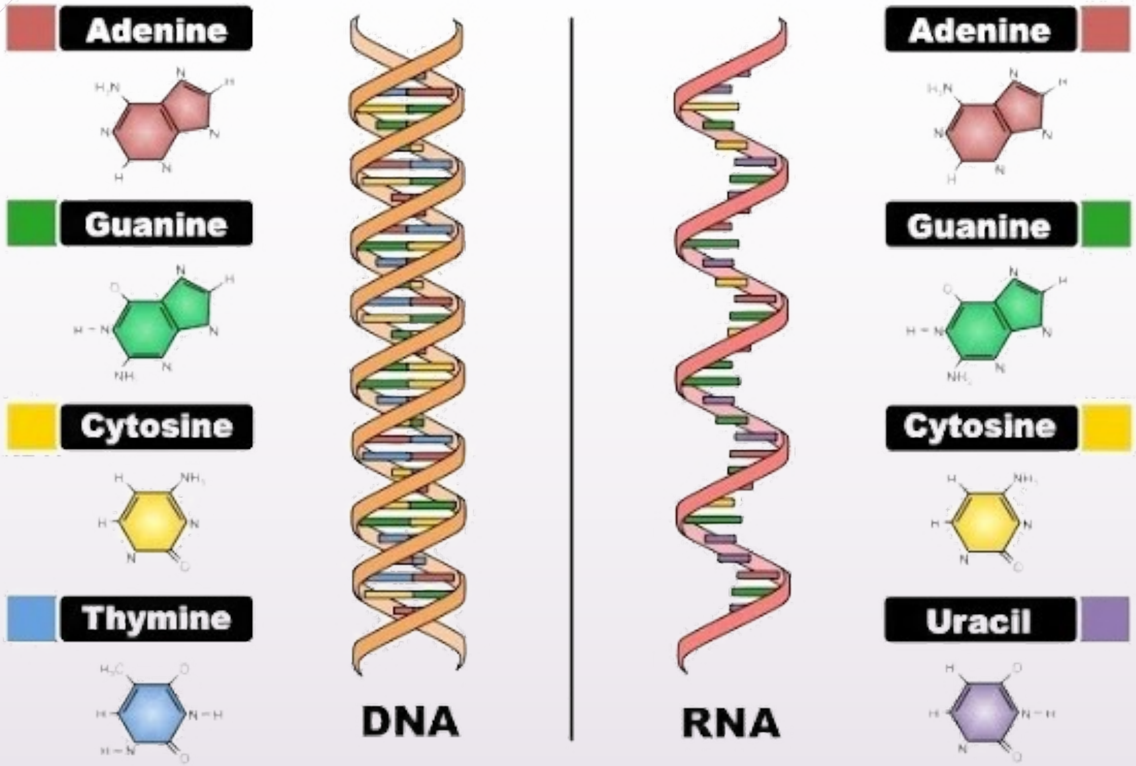




STRUTTURA DEL DNA



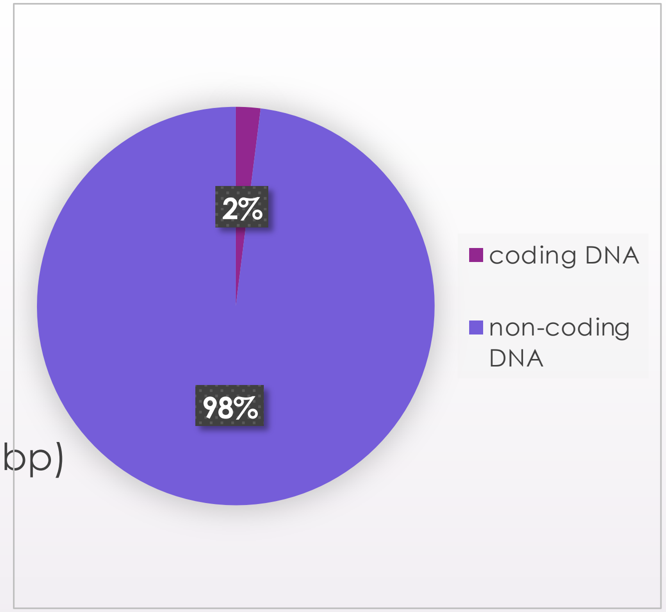
STRUTTURA DEL DNA



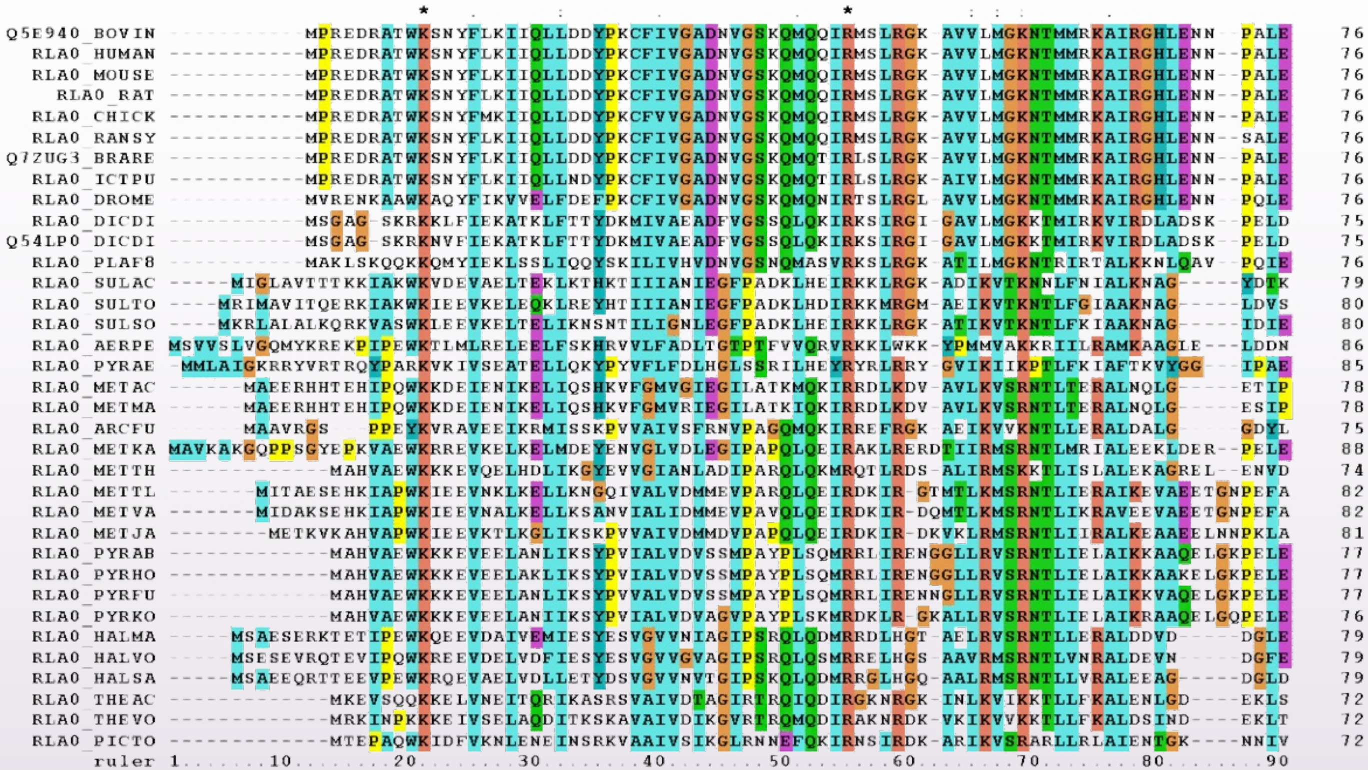
DOGMA CENTRALE DELLA BIOLOGIA

I NUMERI DEL DNA

- 3.2 Gbp
- 20000 geni
- Media: 160 Kbp per gene
- Gene più piccolo: TDF (14 bp)
- Gene più grande: Distrofina (2.3 Mbp)



ALBERI FILOGENETICI



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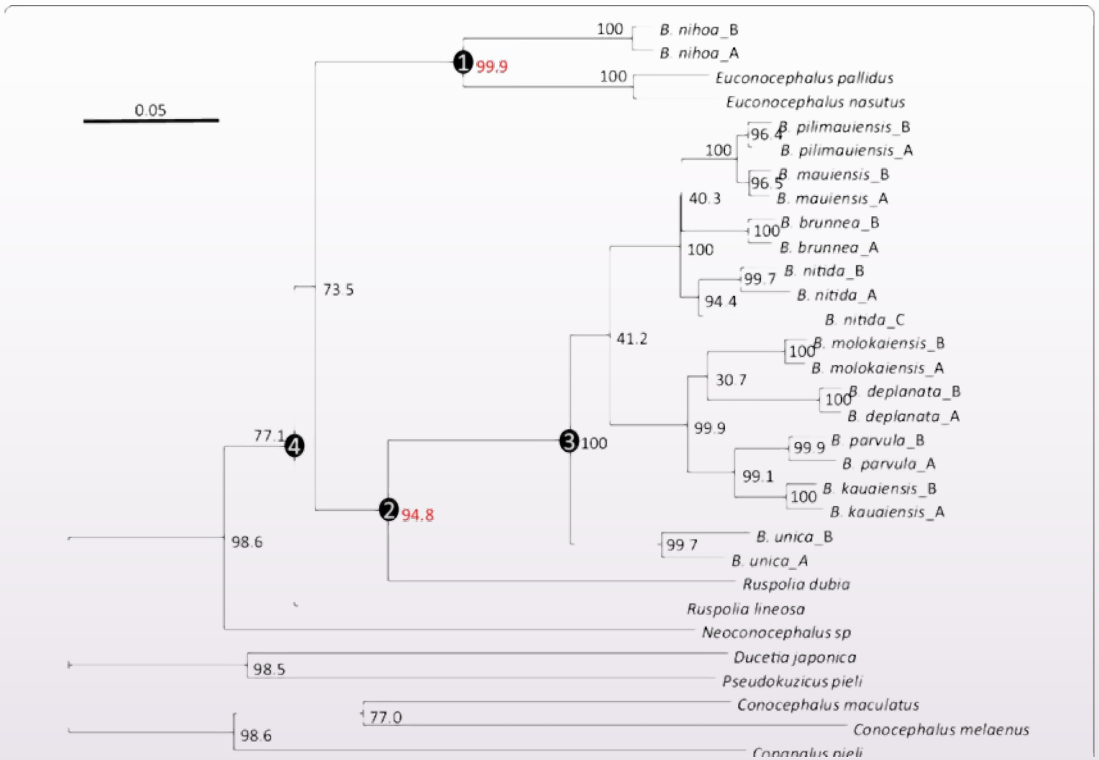

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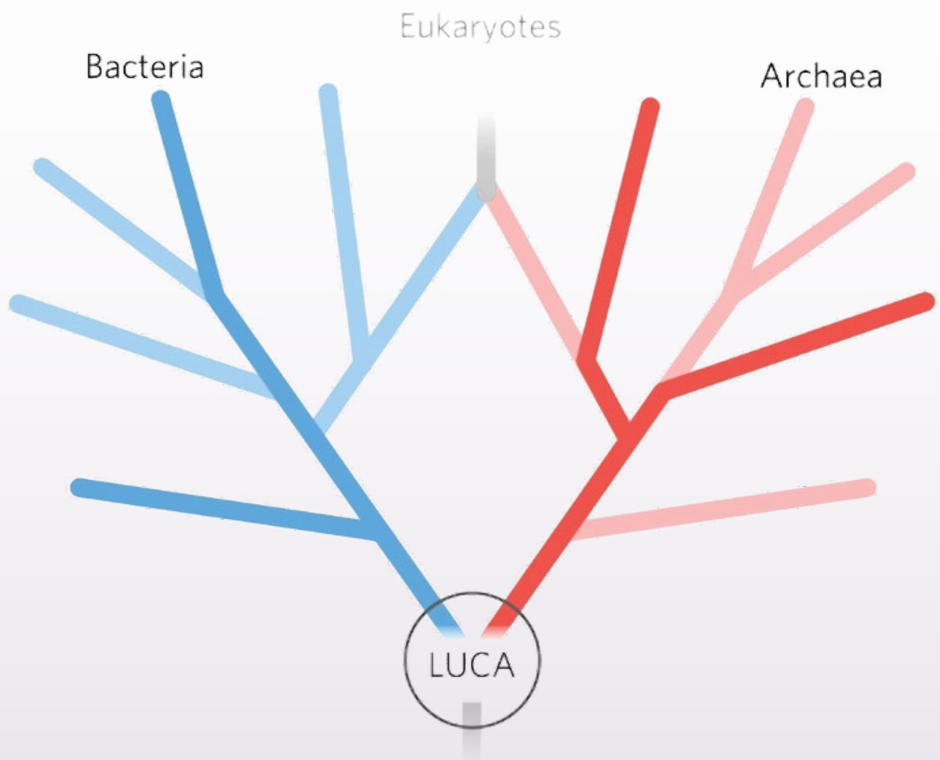


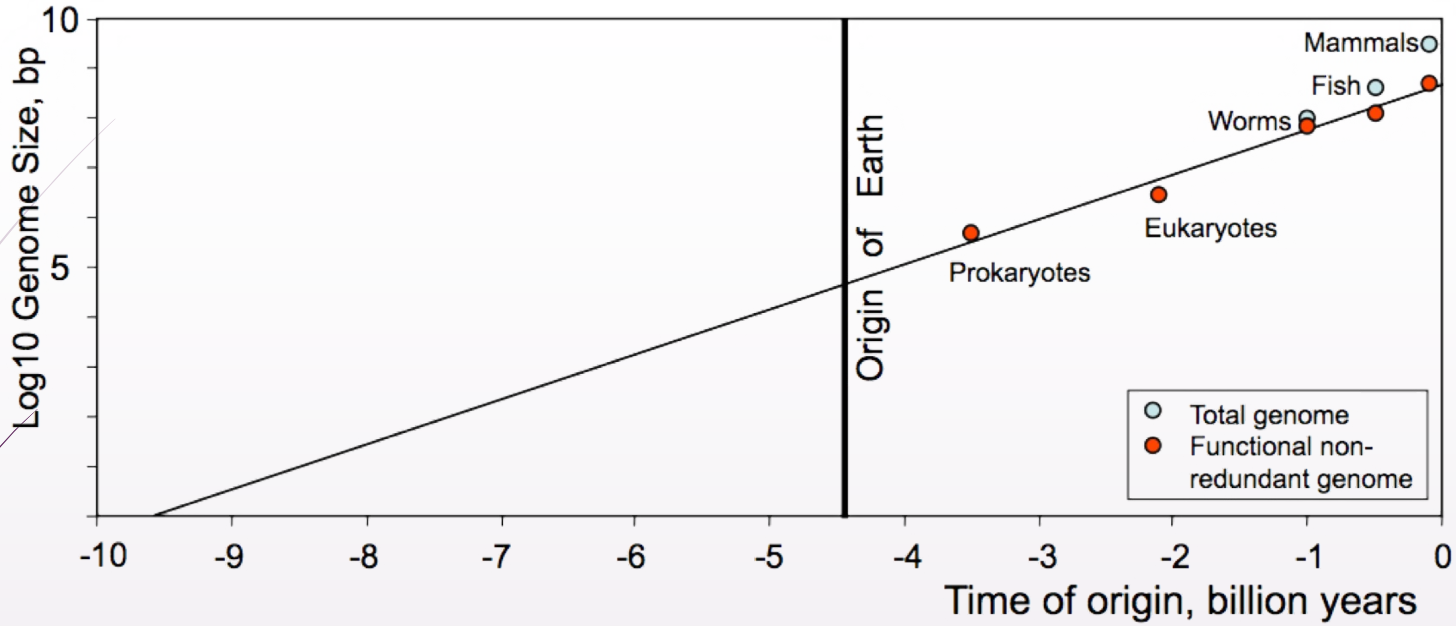


Figure 1. On this semilog plot, the complexity of organisms, as measured by the length of functional non-redundant DNA per genome counted by nucleotide base pairs (bp), increases linearly with time (Sharov, 2012). Time is counted backwards in billions of years before the present (time 0). Modified from Figure 1 in (Sharov, 2006).

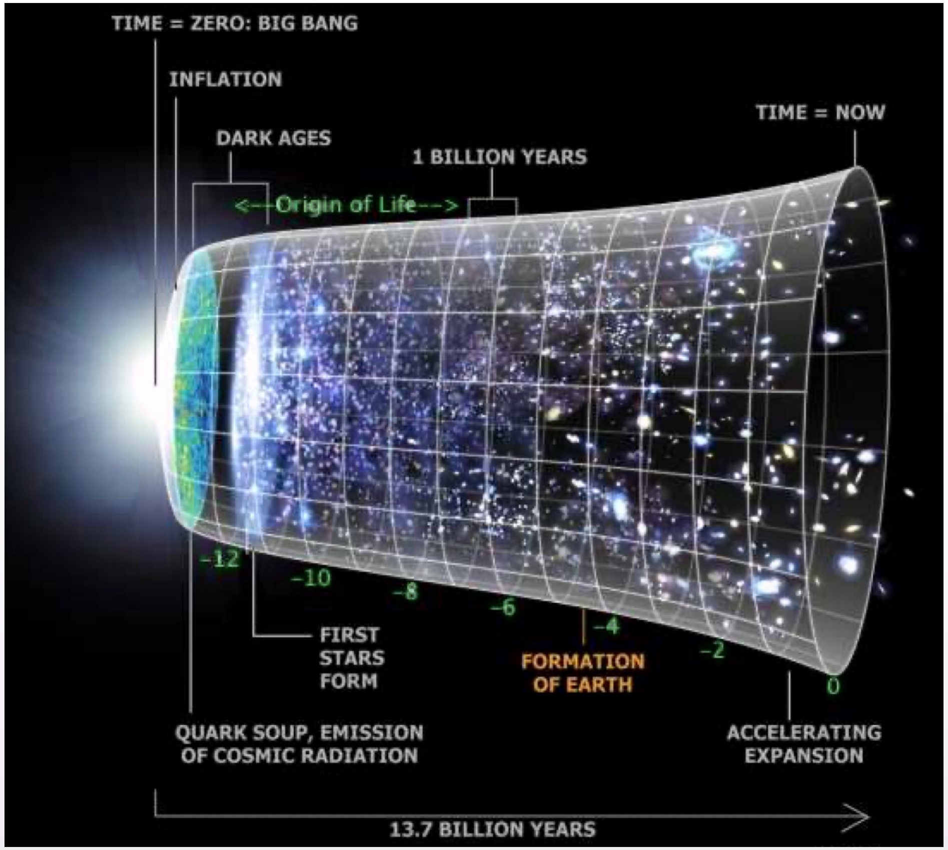
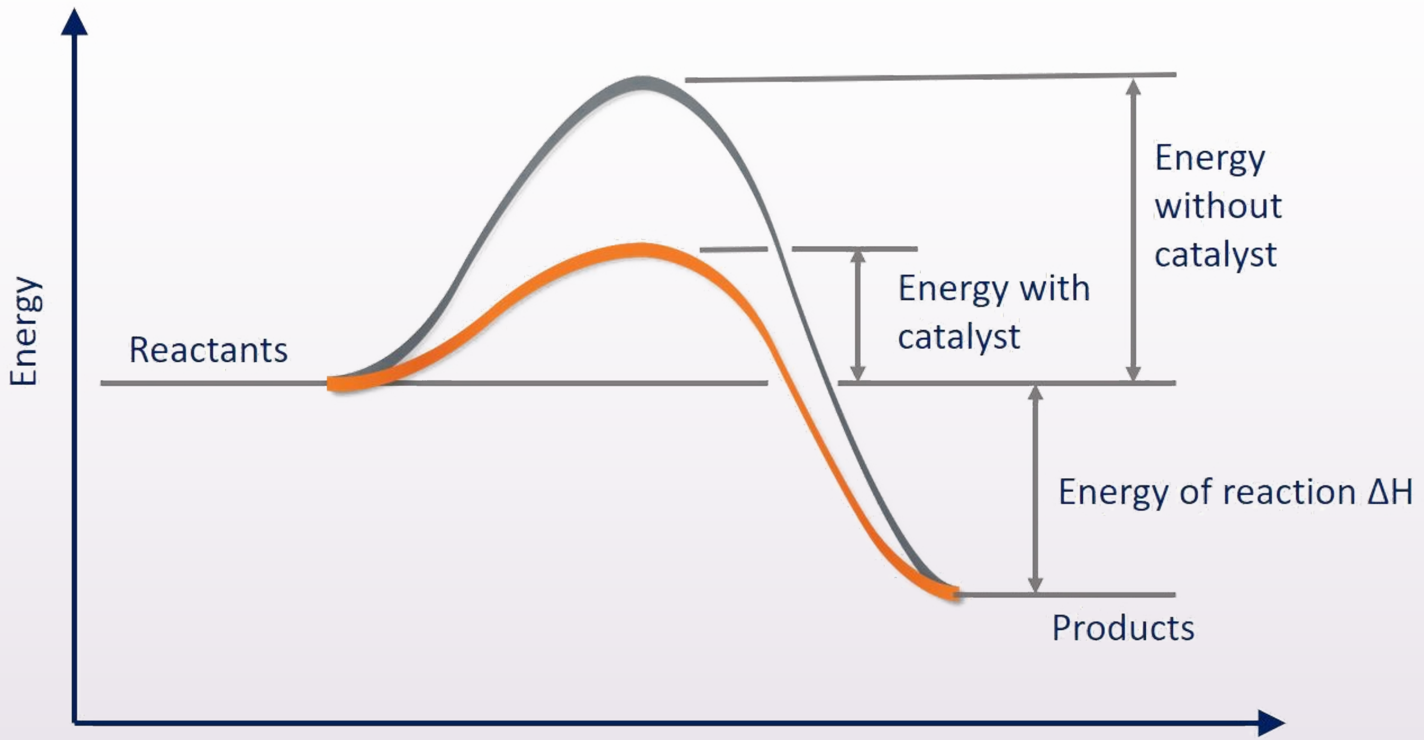


Figure 2. A schematic view of the development of the universe since the Big Bang, courtesy of the Hubble Space Telescope Science Institute, on which we have superimposed our estimate for the origin of life, 9.7 ± 2.5 billion years ago. Note that the "Dark Ages" may have ended at -13.55 billion years (Zheng, *et al*., 2012) (with the Big Bang at -13.75 billion years (Jarosik, *et al*., 2011)), rather than at -11.5 billion years, as depicted.

CATALISI E AUTOCATALISI



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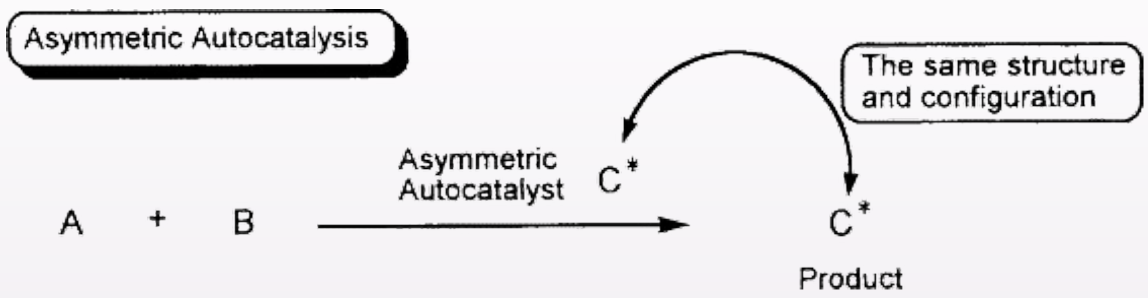

NUOVA TIMELINE

IMPLICAZIONI

- Genetica comune
- Timescale vita complessa
- Erronea ricostruzione ambientale per studi OoL

International Journal of Astrobiology

Article contents

The habitable epoch of the early Universe

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Abraham Loeb

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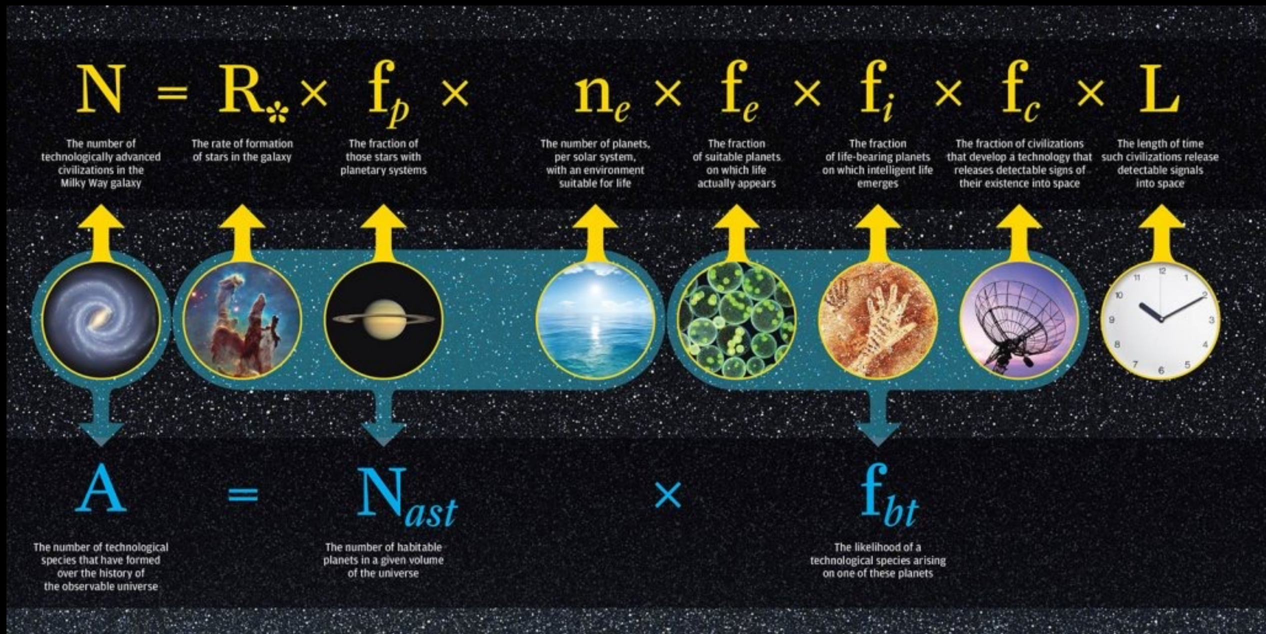
Abstract

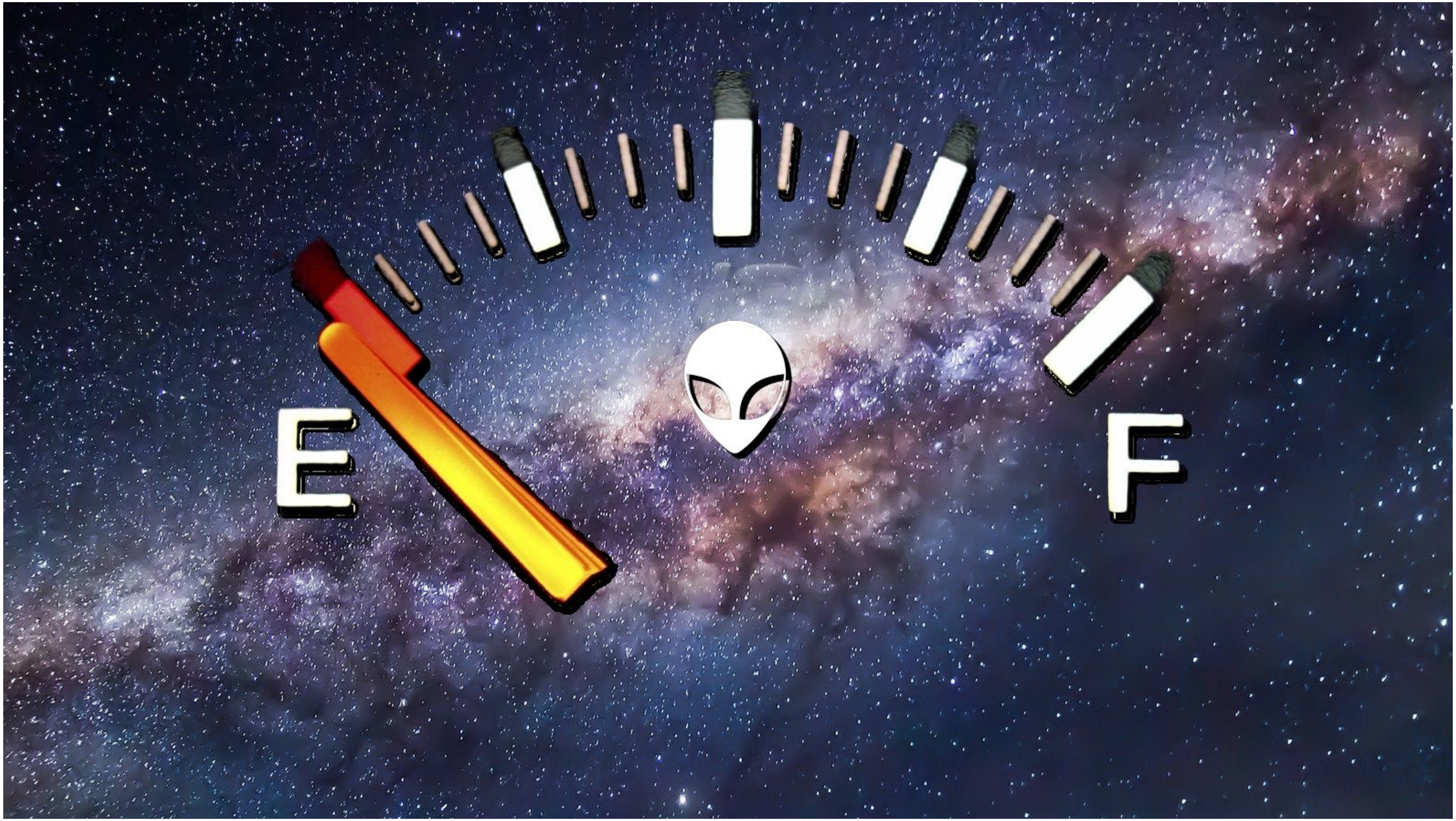
In the redshift range $100 \lesssim (1+z) \lesssim 137$, the cosmic microwave background (CMB) had a temperature of 273–373 K (0–100°C), allowing early rocky planets (if any existed) to have liquid water chemistry on their surface and be habitable, irrespective of their distance from a star. In the standard ΛCDM cosmology, the first star-forming halos within our Hubble volume started collapsing at these redshifts, allowing the chemistry of life to possibly begin when the Universe was merely 10–17 million years old. The possibility of life starting when the average matter density was a million times bigger than it is today is not in agreement with the anthropic explanation for the low value of the cosmological constant.

PARTE III

PROSPETTIVA

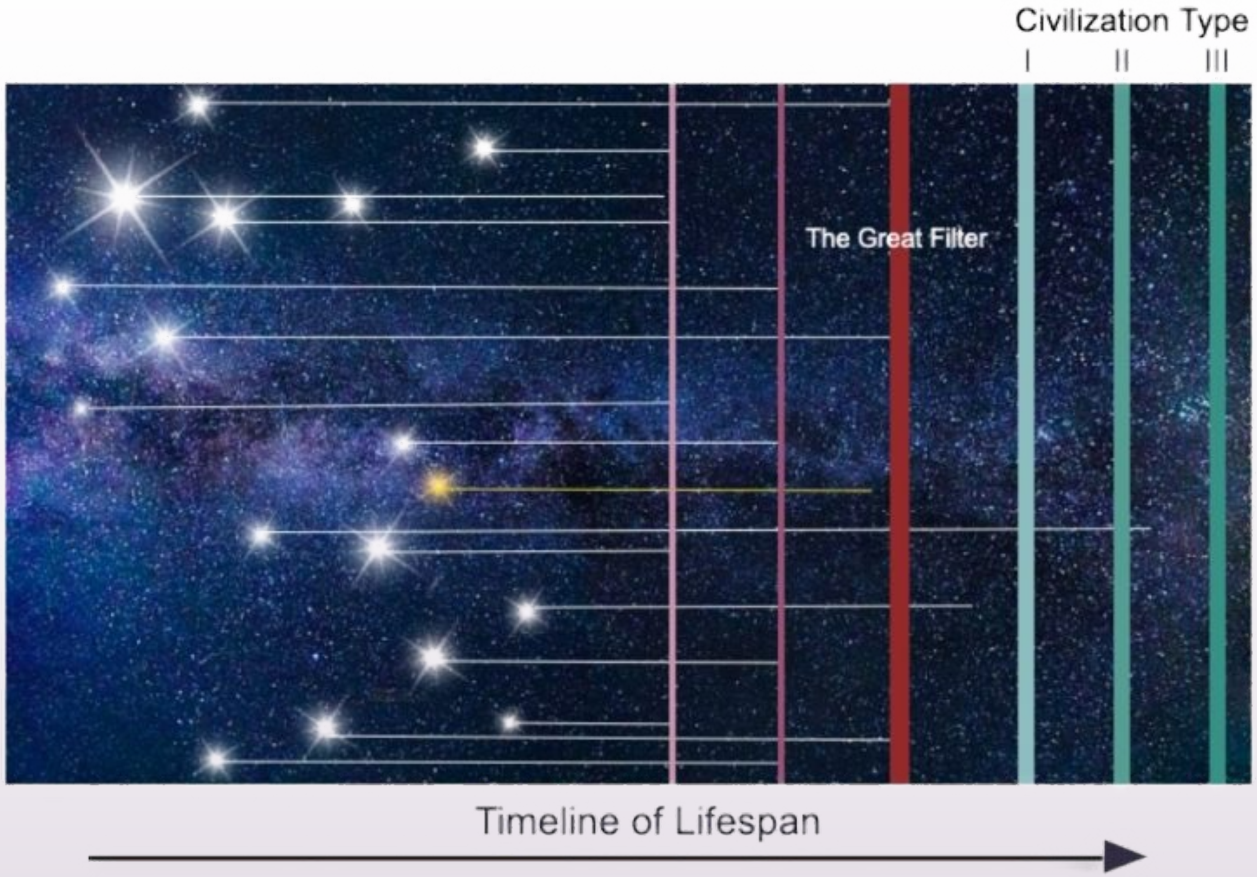
L'EQUAZIONE DI DRAKE




E
F

LA SCALA DI KARDAŠËV

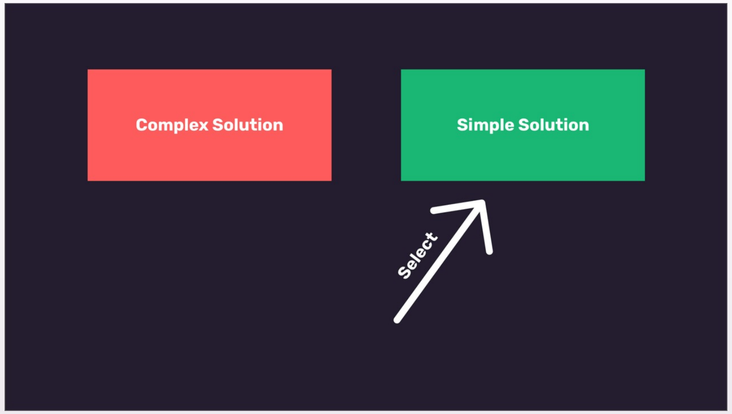
IL GRANDE FILTRO




GRAZIE PER LA VOSTRA ATTENZIONE

EXTRA SLIDE (RASOI)

Rasoio di Occam



Spada laser fiammeggiante di Newton