Space Renaissance International 3rd World Congress

"THE CIVILIAN SPACE DEVELOPMENT"

June 26th – June 30th 2021

At the Intersection of an Evolutionary Singularity, Space Migration and Intelligent Panspermia

Charles Ostman

Visions of Primordial Panspermia

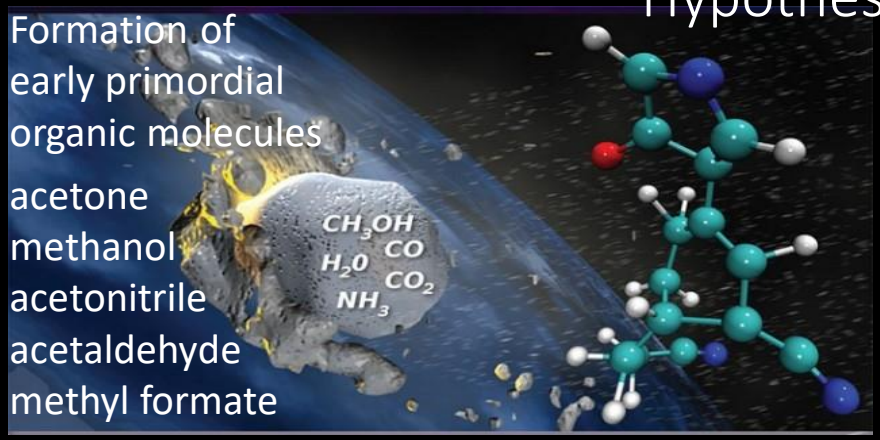
Well, sort of, maybe . . .

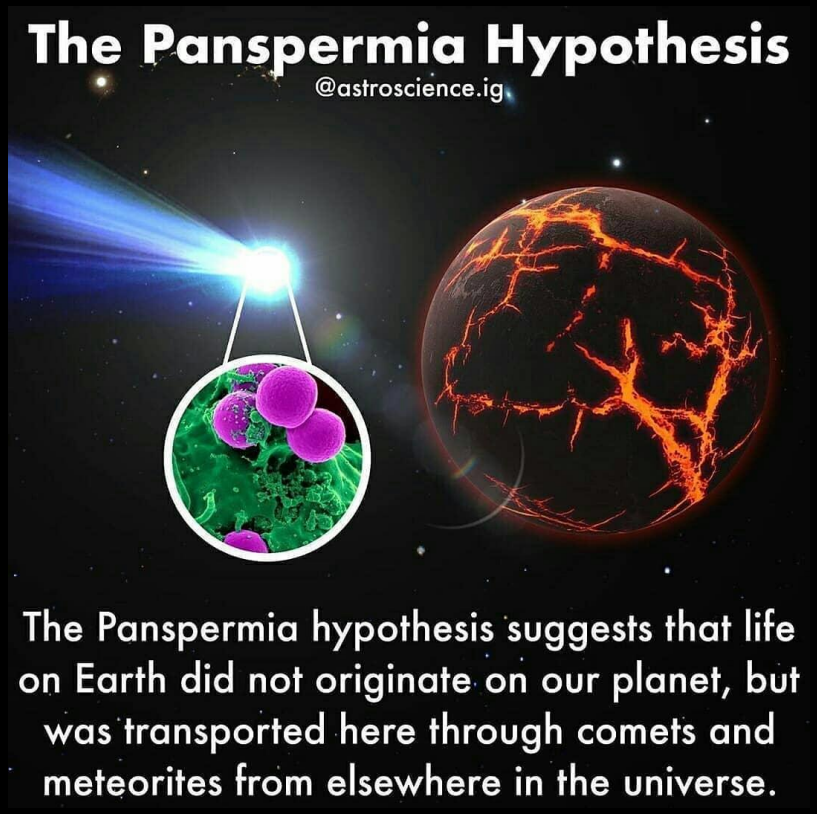
Panspermia holds that life came to Earth as microbes from outer space. (Microbes not shown to scale.)

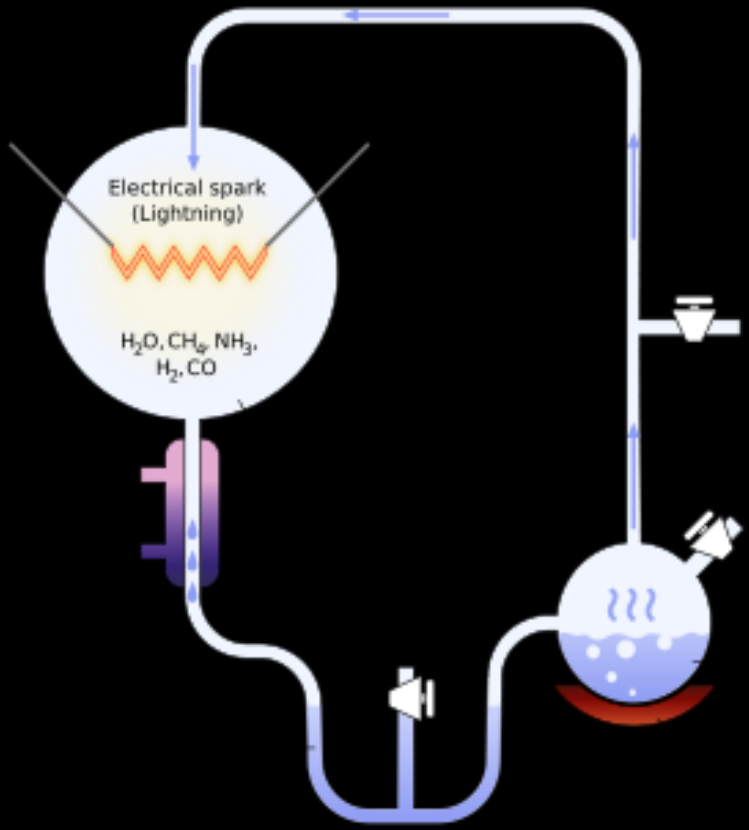
THE SCIENCE OF EVERYTHING
COSMOS

Visions of Primordial Panspermia

Hypothesis, research







Miller-Urey experiment replicated the conditions of early Earth, produced complex organic molecules

1952

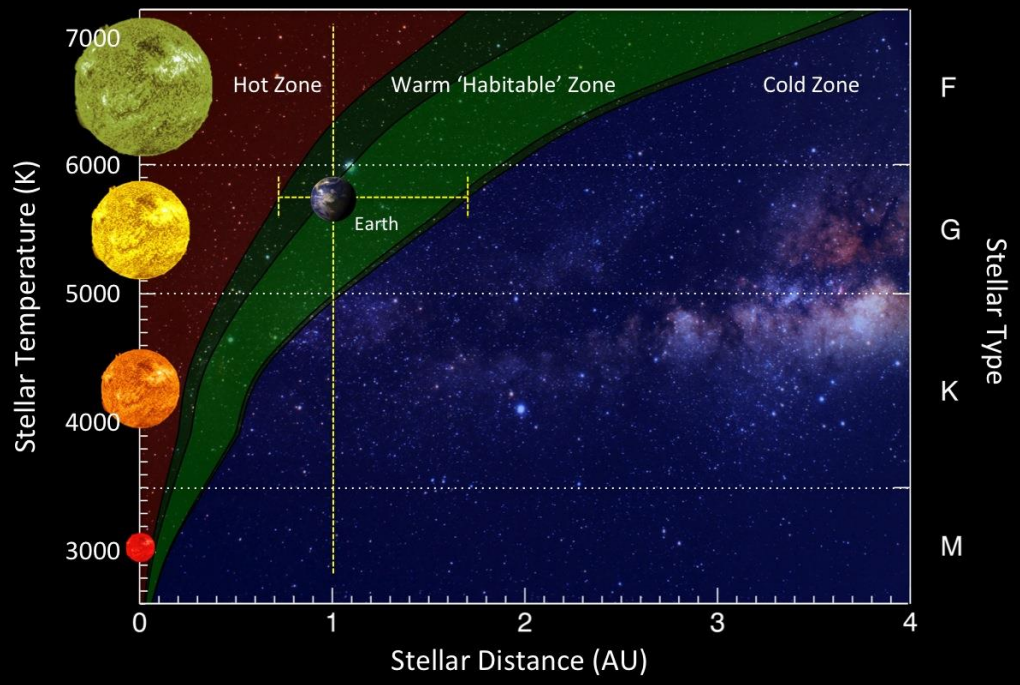
Visions of Primordial Panspermia
In the beginning . . .

πᾶν *(pan)* 'all', and σπέρμα *(sperma)* 'seed')

A distribution model for spreading primordial microscopic lifeforms, bacteria, etc.

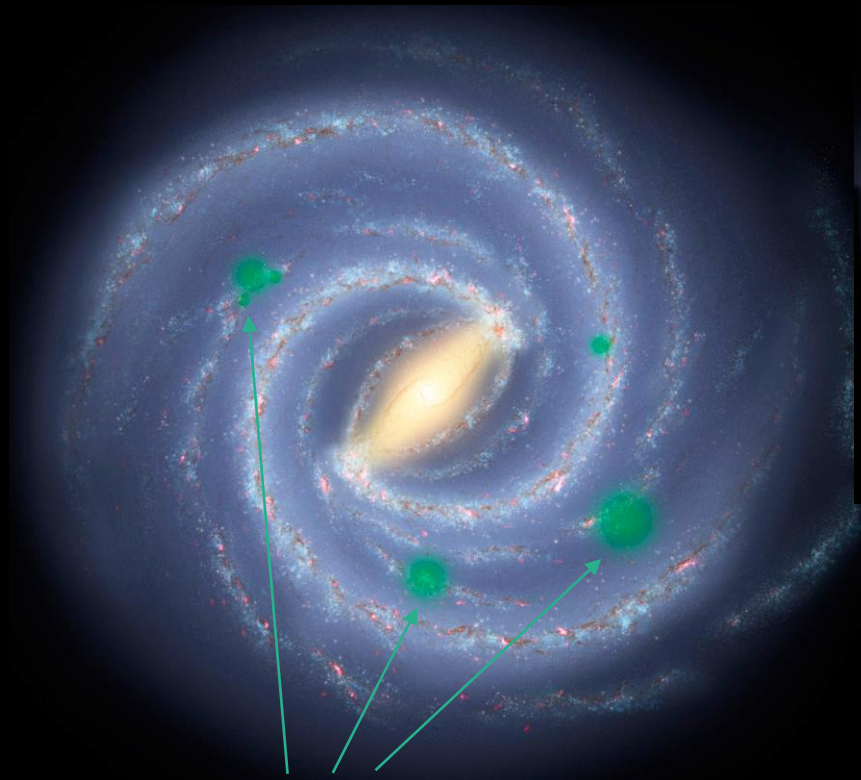
Common model is comets and meteorites, impacting planets in the “goldilocks” temperate zone after their early cooling period, with available sources of water

Habitable Zone of Main Sequence Stars



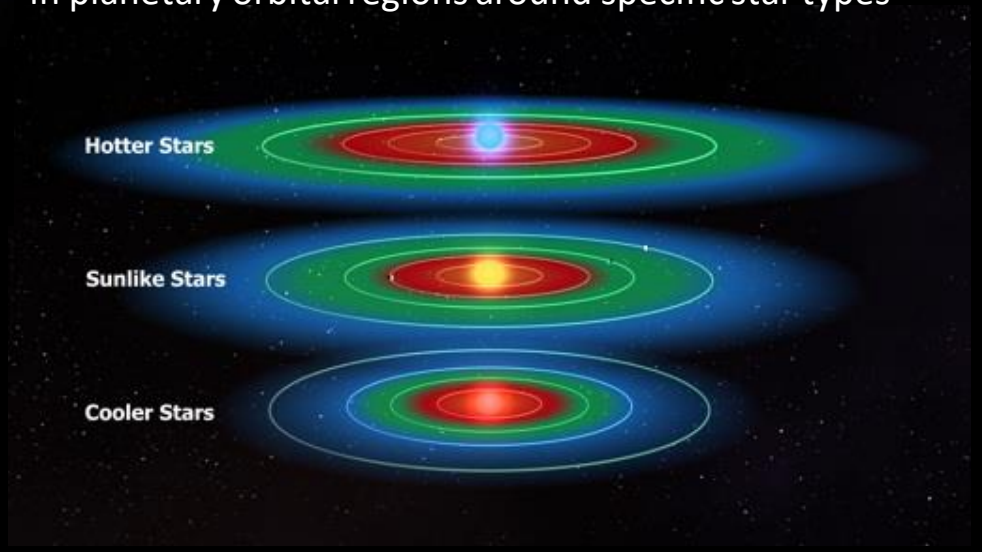
CREDIT: PHL @ UPR Arecibo

Visions of Primordial Panspermia
In the beginning . . .

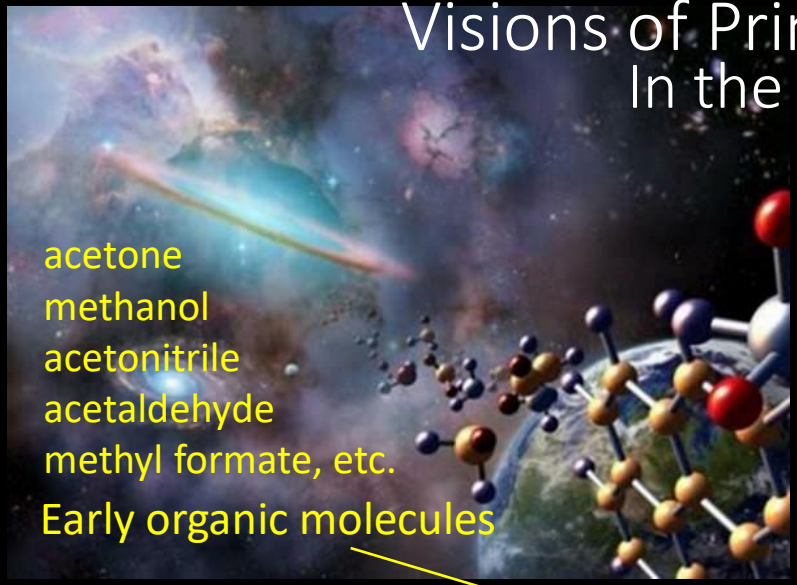


Pockets of intergalactic regions, densely populated with organic proto-molecules, amino acids, etc.

Habitable “goldilocks” zones in generic spiral galaxy, in planetary orbital regions around specific star types

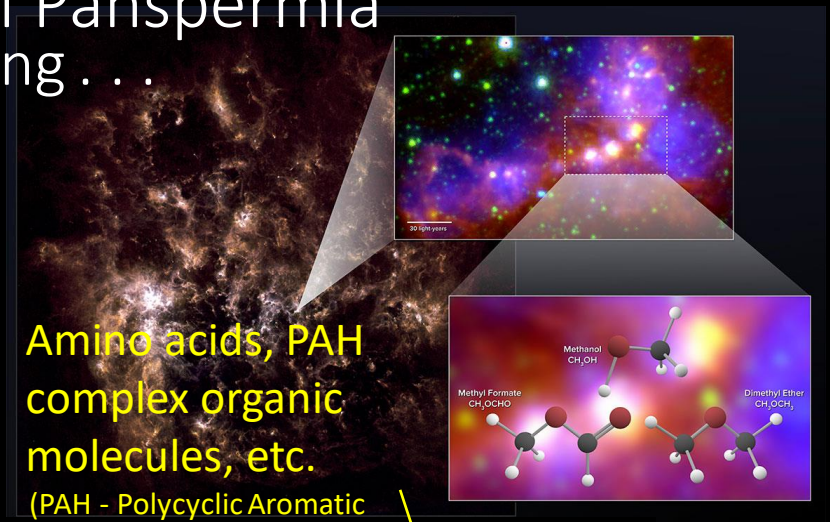


Visions of Primordial Panspermia
In the beginning . . .



acetone
methanol
acetonitrile
acetaldehyde
methyl formate, etc.

Early organic molecules



Amino acids, PAH complex organic molecules, etc.

(PAH - Polycyclic Aromatic Hydrocarbons)

"Big Bang"

13.7 billion yrs.
3 billion yrs.
1 billion yrs.
300 million yrs.
300,000 yrs.
100 sec.
0.01 msec.
0.001 nsec.
o sec.

Primordial Panspermia distribution threshold

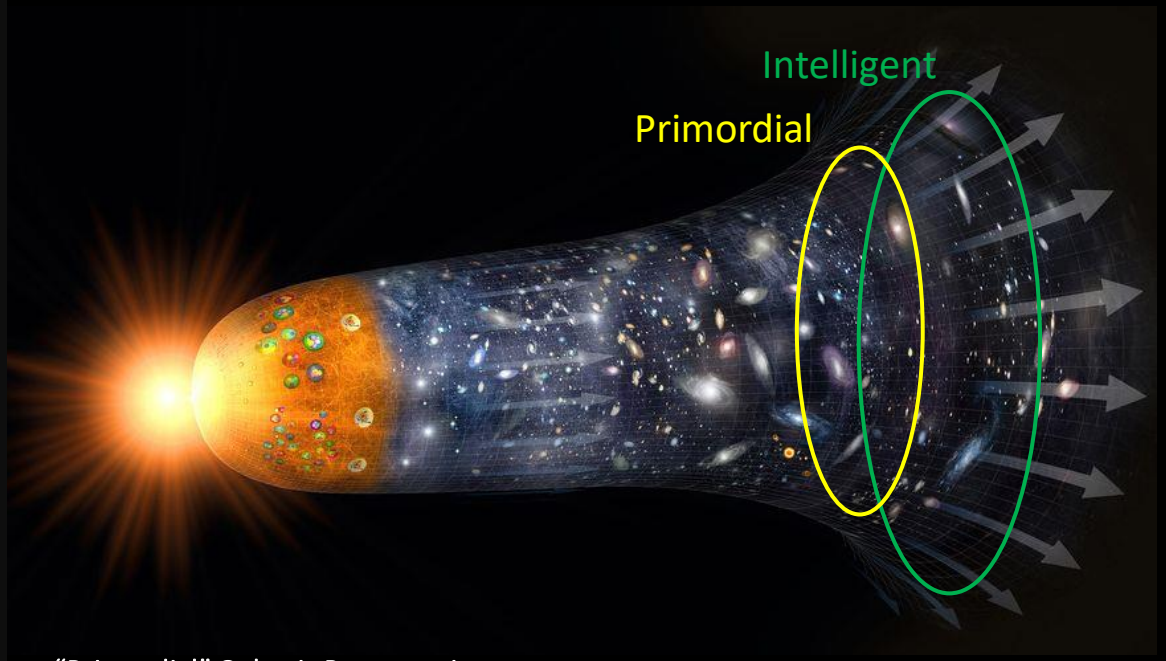
WIMPs formed?
(Weakly Interacting Massive Particles)
Neutrons and protons form out of "quark soup"
Nuclei form
Recombination: Atoms form
First stars form: Stars form. Their light liberates some electrons from atoms.
Galaxies form
Reheating of intergalactic gas
Clusters of Galaxies form

Intelligent Panspermia
post primordial

Post 1st stage singularity evolutionary transition

Pre-primordial organic stew

Singularity Transition threshold
Accelerating space migration



"Primordial" Galactic Panspermia

" panspermia is not exclusively relegated to solar system-sized scales, and the entire Milky Way could potentially be exchanging biotic components across vast distances."
Idan Ginsburg[1], Manasvi Lingam[1], and Abraham Loeb[1]
Published 2018 November 19 • © 2018. The American Astronomical Society.

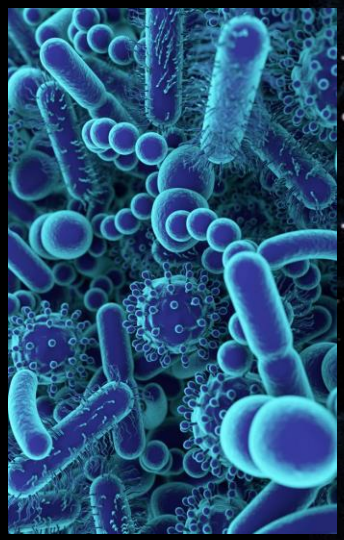
Communicating Extra Terrestrial Intelligent (CETI) civilizations – "Intelligent" Panspermia

The Astrobiological Copernican Weak and Strong Limits for Intelligent Life
Theoretical distances between civilizations 300 lyr – 7000 lyr / lifespan of civilizations
" could be over 36 active communicating intelligent civilizations in our home Galaxy."
Tom Westby[1] and Christopher J. Conselice[1] University of Nottingham
Published 2020 June 15 • © 2020. The American Astronomical Society.

Intelligent Panspermia
post primordial

Distribution of lifeforms across the cosmos from planetary civilizations

Unintentional Intentional



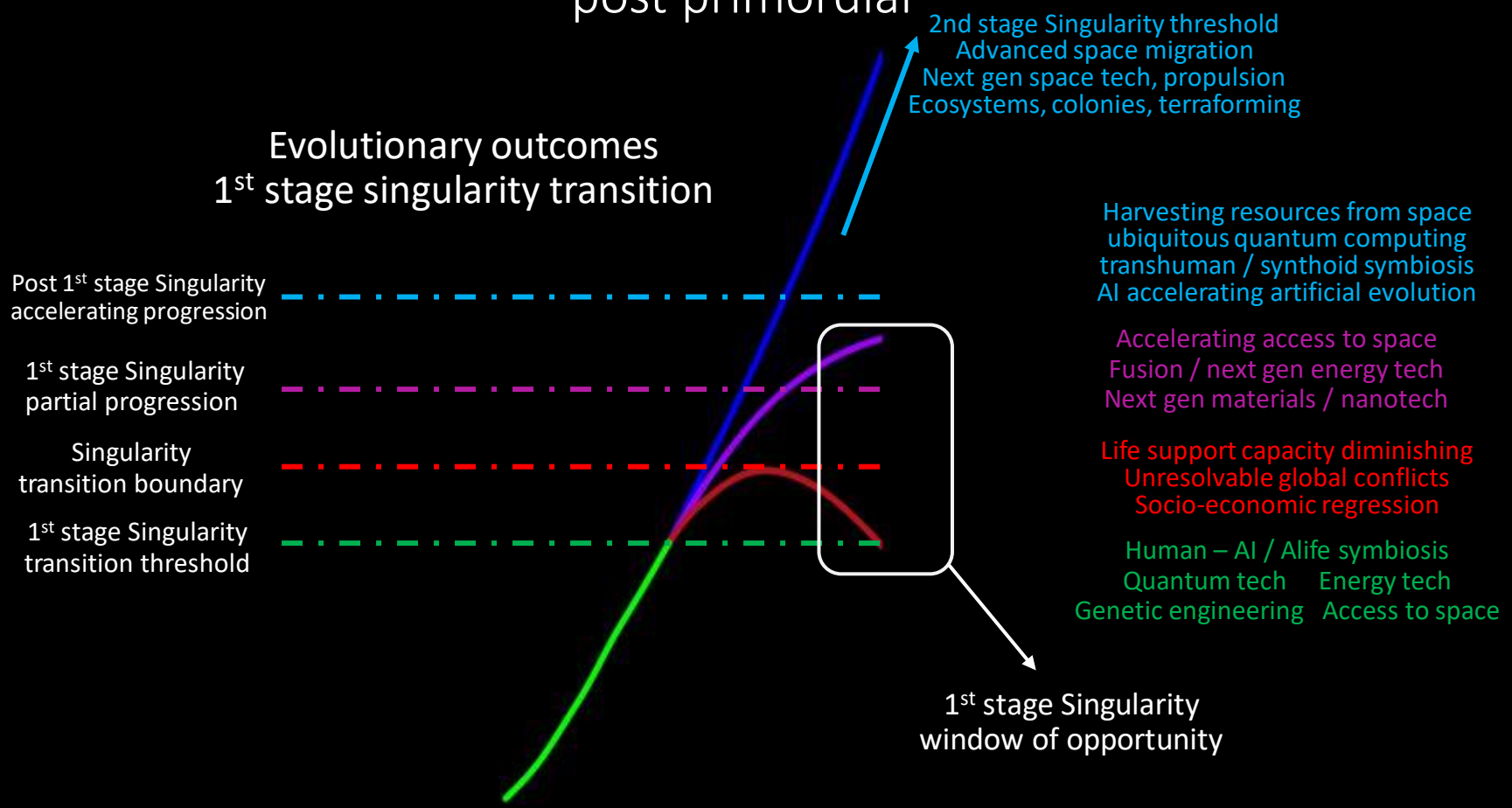
Approaching the “singularity” evolutionary threshold

The “singularity” is not a single anything, but rather an evolutionary transition stage

Singularity stages are an amalgam of synergistically interrelated, amplifying phenomena

Successive singularity transition stages are the artifacts of combined causality and correlation

Intelligent Panspermia
post primordial



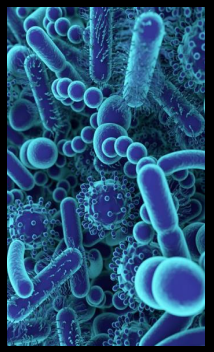
Intelligent Panspermia

the Evolutionary Test

Evolution tends to be a trauma induced process.
Provided the periodicity and amplitude of encountered trauma cycles do not exceed the system capacity to adapt, the system evolves to a more functional form of existence.

Evolution tends to operate as a type of fractal.
Synergistically interrelated phenomena operating at multiple scales of resolution.

Evolution tends to favor the most adaptive.
Adaptation vs. timeline of iterations



Intelligent Panspermia

unintentional intentional

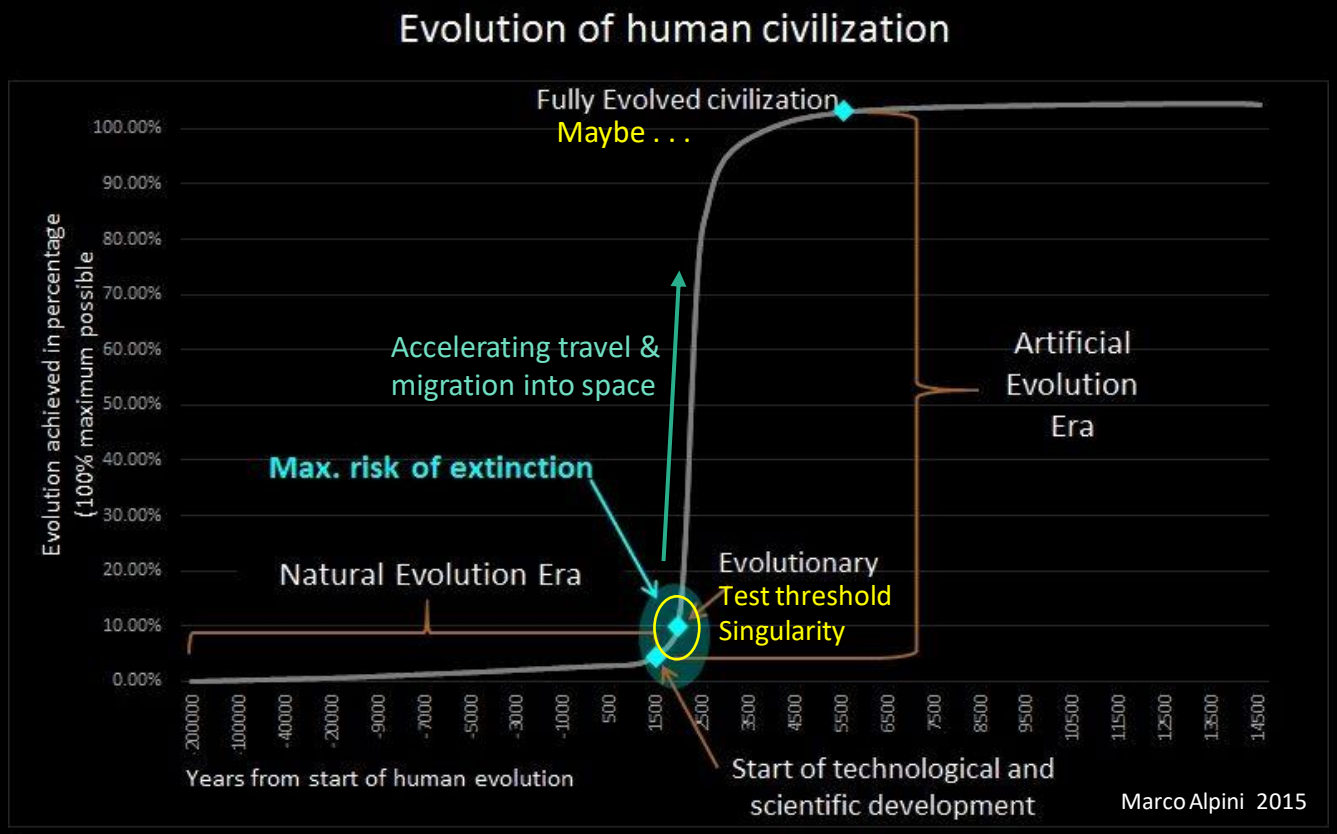
Next subset of worlds colonize other star systems

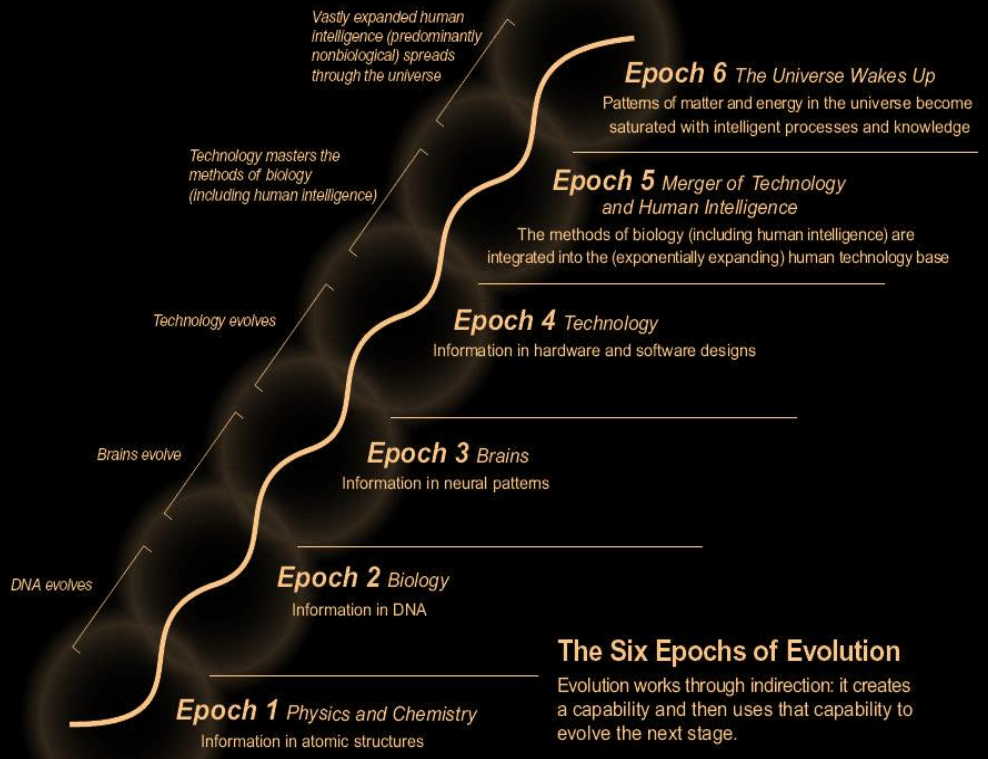
Subset of those worlds colonize local star system

Only some have passed this test

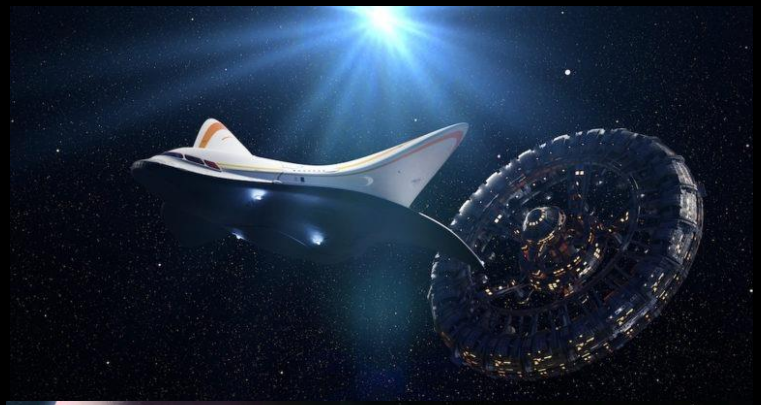
Many worlds have faced the same test

The approaching evolutionary test



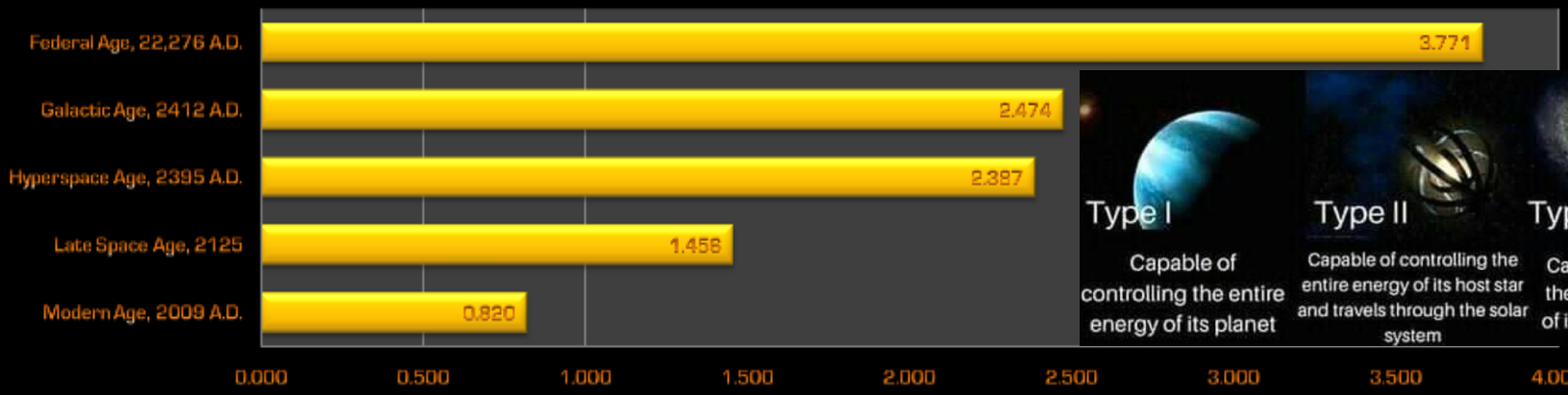


6 epochs human of evolution – Ray Kurzweil 2005

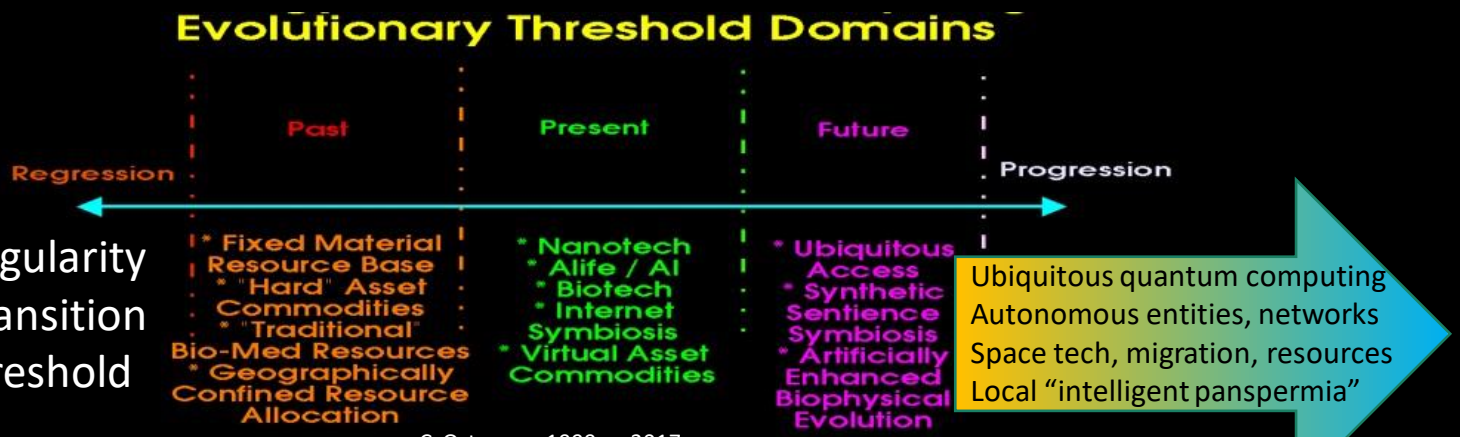


Kardashev scale of human civilisation

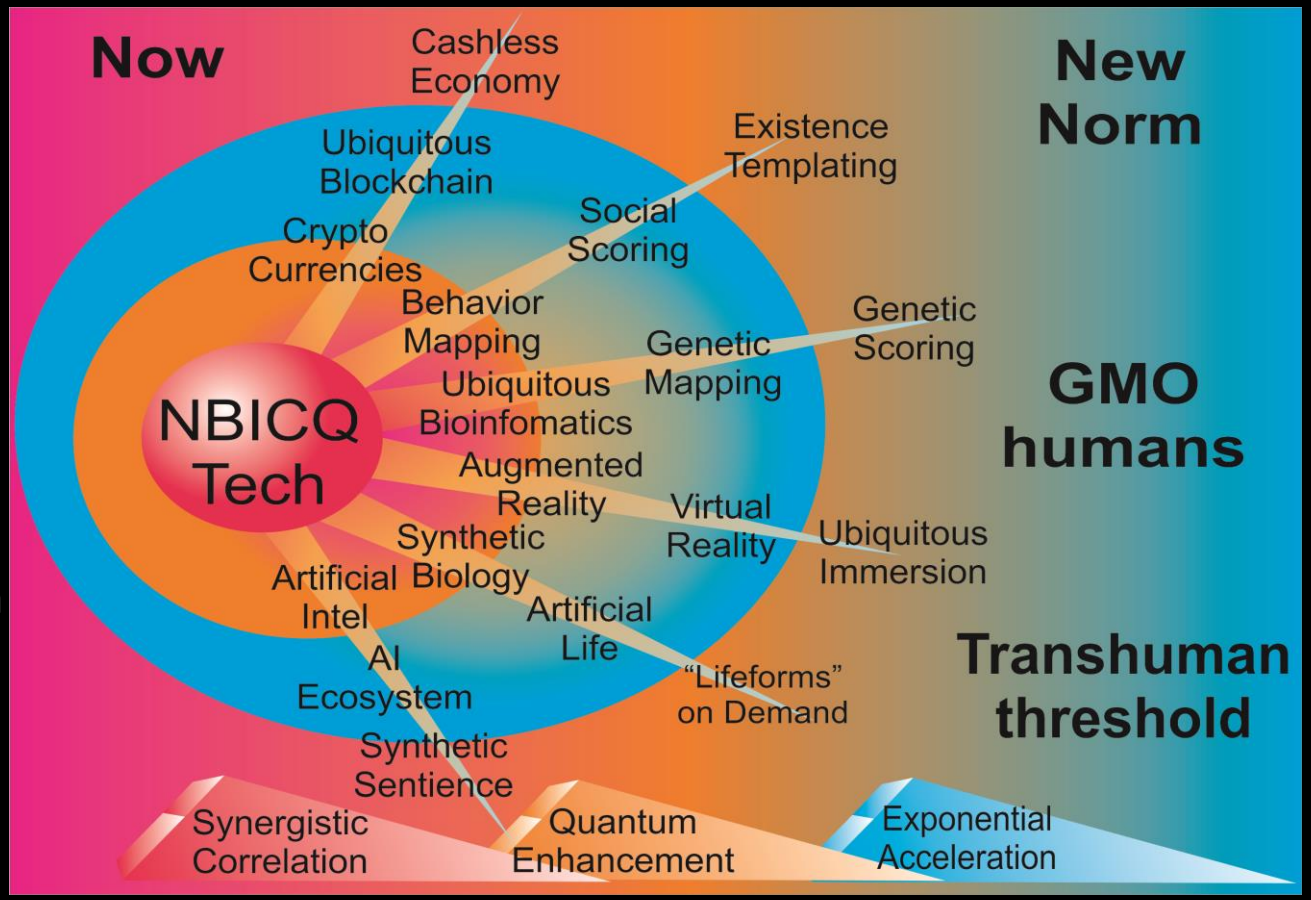
Nikolai Kardashev - 1964



The approaching Singularity
Next evolutionary transition
Incremental test threshold

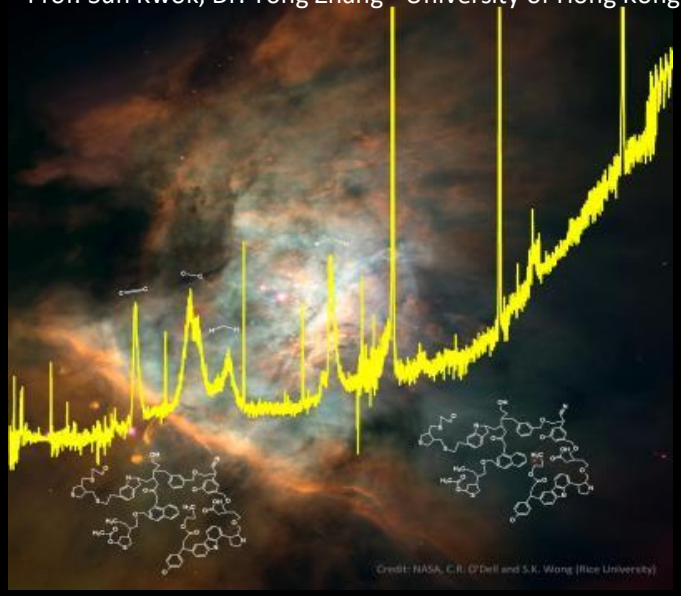


NBICQ
Nano
Bio
Info
Cogno
Quantum



" . . . astronomical spectra have features that cannot be explained by PAH molecules . . . team proposes that the substances generating these infrared emissions have chemical structures that are much more complex " 2011

Prof. Sun Kwok, Dr. Yong Zhang - University of Hong Kong

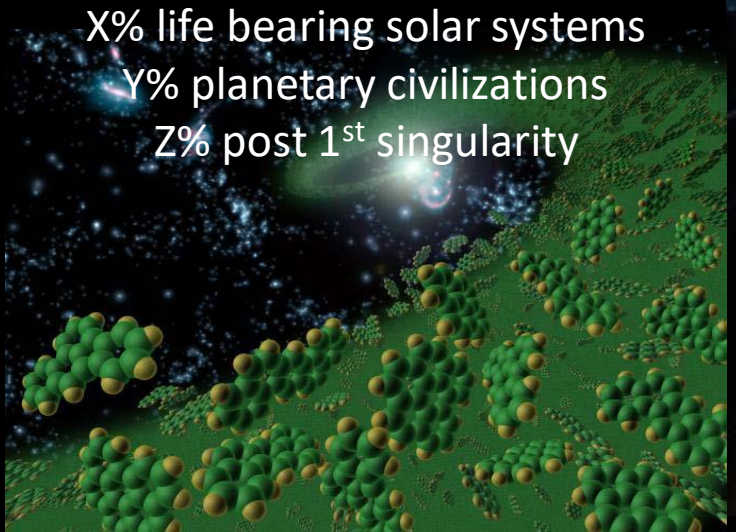


Proto-life is apparently ubiquitous

X% life bearing solar systems

Y% planetary civilizations

Z% post 1st singularity



The Observable Universe

2 trillion galaxies

IG/FB: Inevitablespace

500 billion trillion stars

(> 200 billion trillion planets)

80 billion trillion G type stars

20 billion trillion white dwarfs

200 million trillion neutron stars

2 trillion supermassive black holes

& 200 million trillion stellar black holes

Drake equation . . . Singularity stage evolution, intelligent panspermia

$$N = R_* \times f_p \times n_e \times f_e \times f_i \times f_c \times L$$

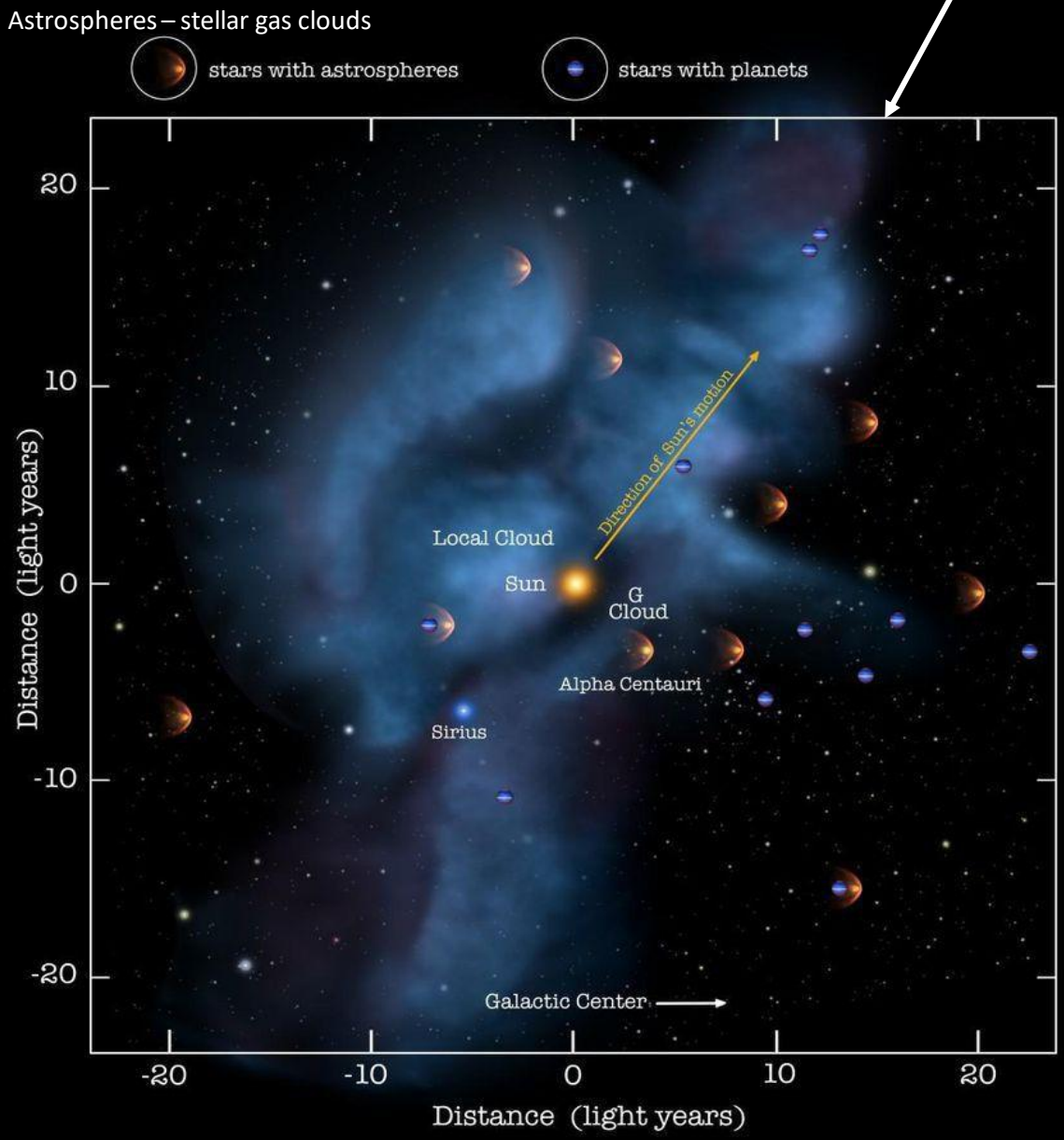
- R_*: The rate of formation of stars in the galaxy
- f_p: The fraction of those stars with planetary systems
- n_e: The number of planets, per solar system, with an environment suitable for life
- f_e: The fraction of suitable planets on which life actually appears
- f_i: The fraction of life-bearing planets on which intelligent life emerges
- f_c: The fraction of civilizations that develop a technology that releases detectable signs of their existence into space
- L: The length of time such civilizations release detectable signals into space
- N: The number of technologically advanced civilizations in the Milky Way galaxy

$$A = N_{ast} \times f_{bt}$$

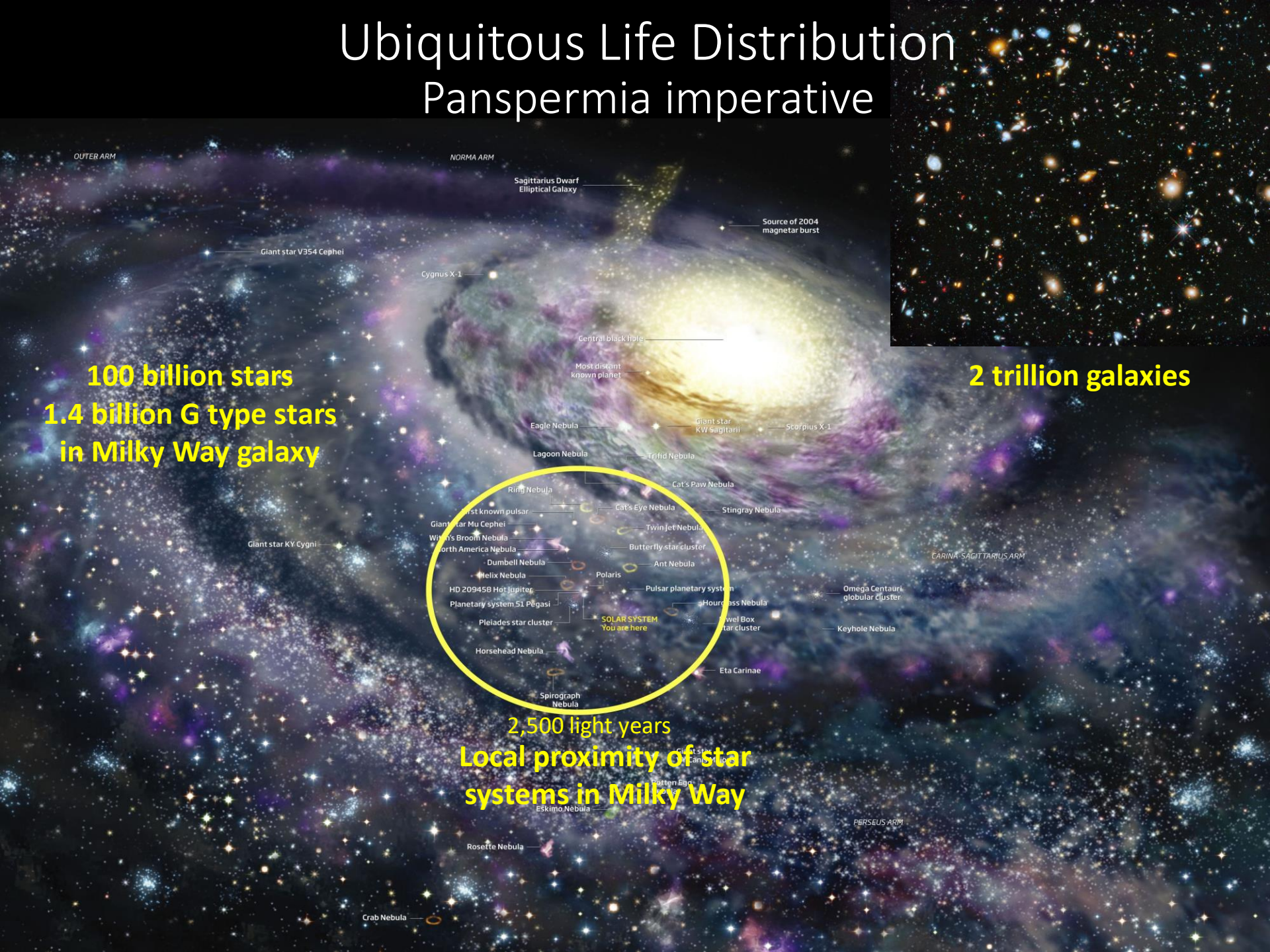
- A: The number of technological species that have formed over the history of the observable universe
- N_{ast}: The number of habitable planets in a given volume of the universe
- f_{bt}: The likelihood of a technological species arising on one of these planets

Evolutionary transitional “Singularity” increments
Space travel, migration, colonization
“Intelligent” panspermia

10 trillion exoplanets in our Milky Way galaxy
Local proximity solar systems with exoplanets



Ubiquitous Life Distribution
Panspermia imperative



100 billion stars
1.4 billion G type stars in Milky Way galaxy

2 trillion galaxies

2,500 light years
Local proximity of star systems in Milky Way

How life on Earth really got its start.

Fini

Thank you for your time and attention

Charles Ostman https://www.historianofthefuture.com/