

Astronomy on Tap, Bengaluru

29th September 2025

The Cosmic Recipe for Life

A Love Letter To Our Stellar Ancestors

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**“You Are My
Stardust”**

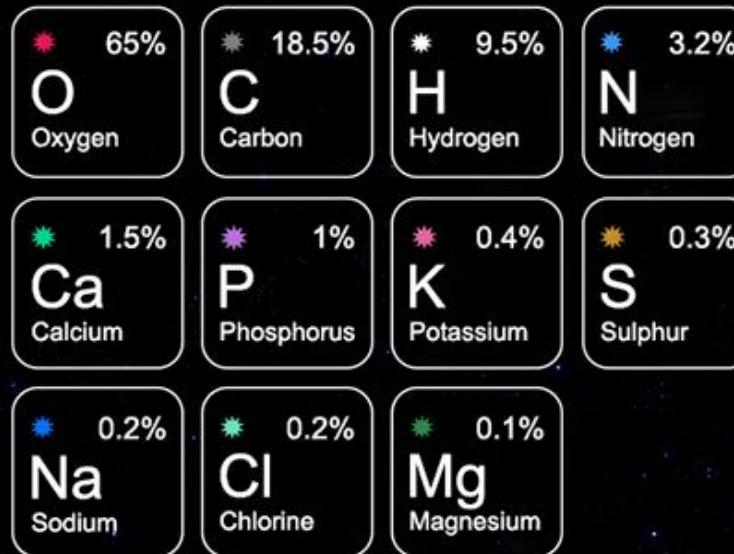


What exactly is stardust?

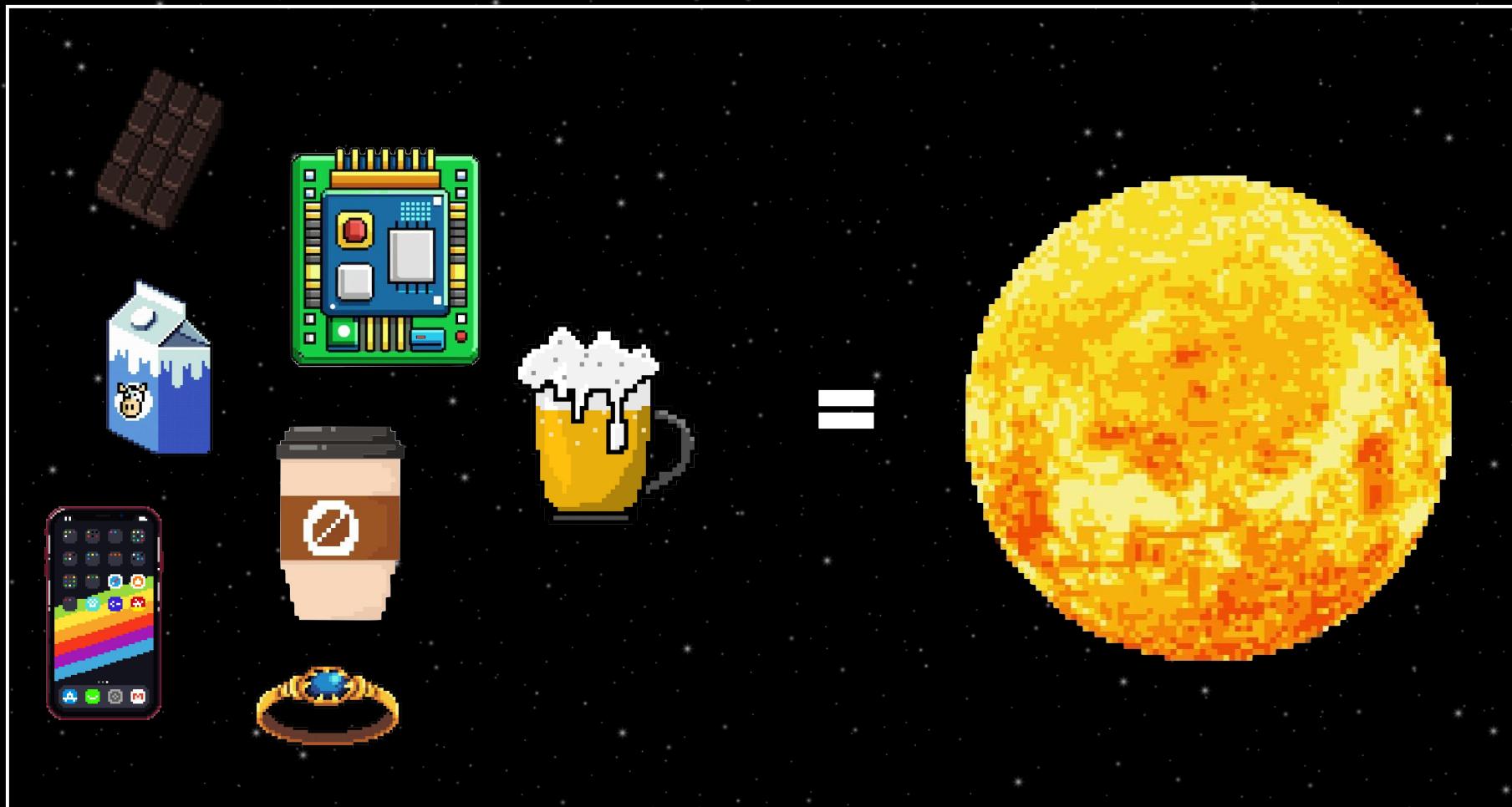
Stardust ≠ Space Glitter

Working definition: *All atoms heavier than hydrogen and helium, “cooked” up inside stars.*





Trace elements less than 1%: **B** Boron, **Cr** Chromium, **Co** Cobalt, **Cu** Copper, **F** Fluorine, **I** Iodine, **Fe** Iron, **Mn** Manganese, **Mc** Molybdenum, **Se** Selenium, **Si** Silicon, **Tin**, **V** Vanadium, **Zn** Zinc



13,800,000,000

Years Ago...

*The Only Story *ACTUALLY* as old as time*



THE
**Big
Bang**

The First 3 Minutes: Big Bang Nucleosynthesis

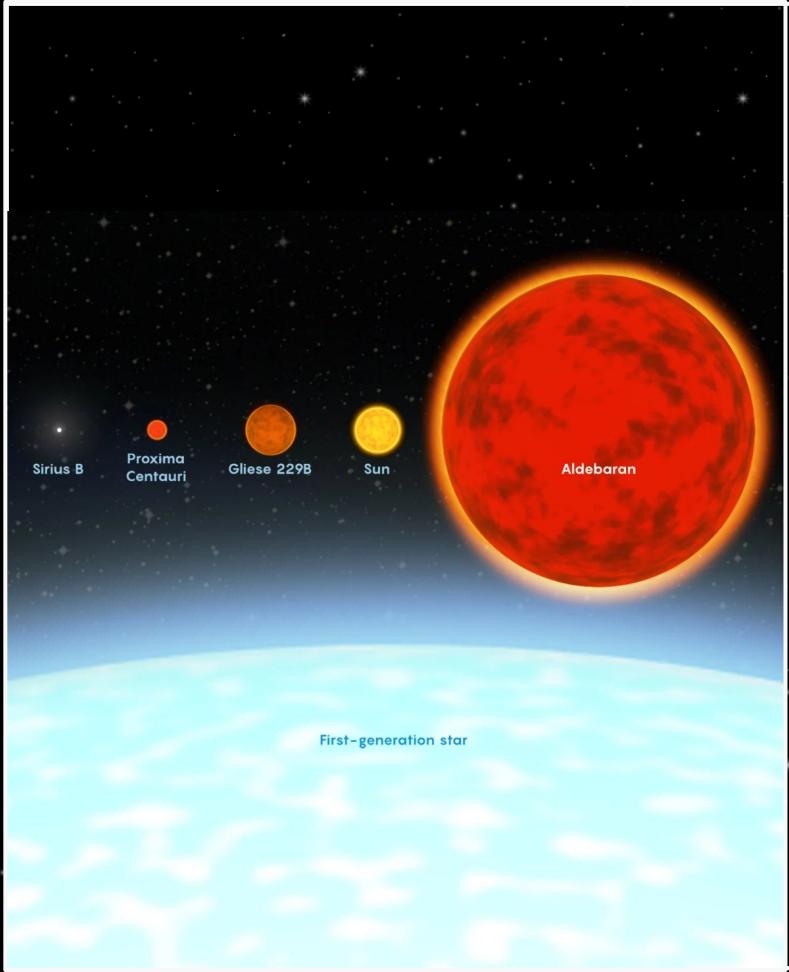
H
B

He
B

Li
C

Be
c

H B		B Big Bang	L Large stars	\$ Super-novae															He B
Li C	Be c		Cosmic rays	Small stars	M Man-made														
Na L	Mg L					B C	C S L	N S L	O S L	F L	Ne S L								
K L	Ca L	Sc L	Ti \$ L	V \$ L	Cr L	Mn L	Fe \$ L	Co \$	Ni \$ L	Cu L	Zn L	Al \$ L	Si \$ L	P L	S S L	Cl L	Ar L		
Rb \$ L	Sr L	Y L	Zr L	Nb L	Mo \$ L	Tc L	Ru \$ L	Rh \$	Pd \$ L	Ag \$ L	Cd \$ L	In \$ L	Ge \$ L	As L	Se \$ L	Br \$	Kr \$		
Cs \$	Ba L		Hf \$ L	Ta \$ L	W \$ L	Re \$	Os \$	Ir \$	Pt \$	Au \$	Hg \$ L	Tl \$ L	Pb \$	Sb \$	Te \$	I \$	Xe \$		
Fr \$	Ra \$		La L	Ce L	Pr \$ L	Nd \$ L	Pm \$ L	Sm \$ L	Eu \$	Gd \$	Tb \$	Dy \$	Ho \$	Er \$	Tm \$	Yb \$ L	Lu \$		
			Ac \$	Th \$	Pa \$	U \$	Np \$	Pu \$	Am M	Cm M	Bk M	Cf M	Es M	Fm M	Md M	No M	Lr M		



Live Fast, Die Young

The First Generation Stars

Population!!!

THE
FIRST
STARS



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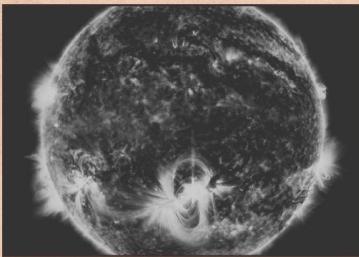
BREAKING NEWS

THE TALE OF A STAR

Every star begins in a nebula — a vast cloud of gas and dust drifting in space. If you've seen the Hubble image of the Pillars of Creation, that's a stellar nursery. In these nurseries, gravity starts pulling gas together. Clumps collapse, heating up under pressure — like the universe shoving dust into a cosmic pressure cooker. And then — boom. At the center, temperatures soar to millions of degrees, nuclear fusion ignites, and a star is born. A new beacon of light in the darkness. Once lit, a star settles into its longest, steadiest phase — what we call the main sequence.

Our Sun is here now. Four and a half billion years into a ten-billion-year run. Reliable, steady, always shining.

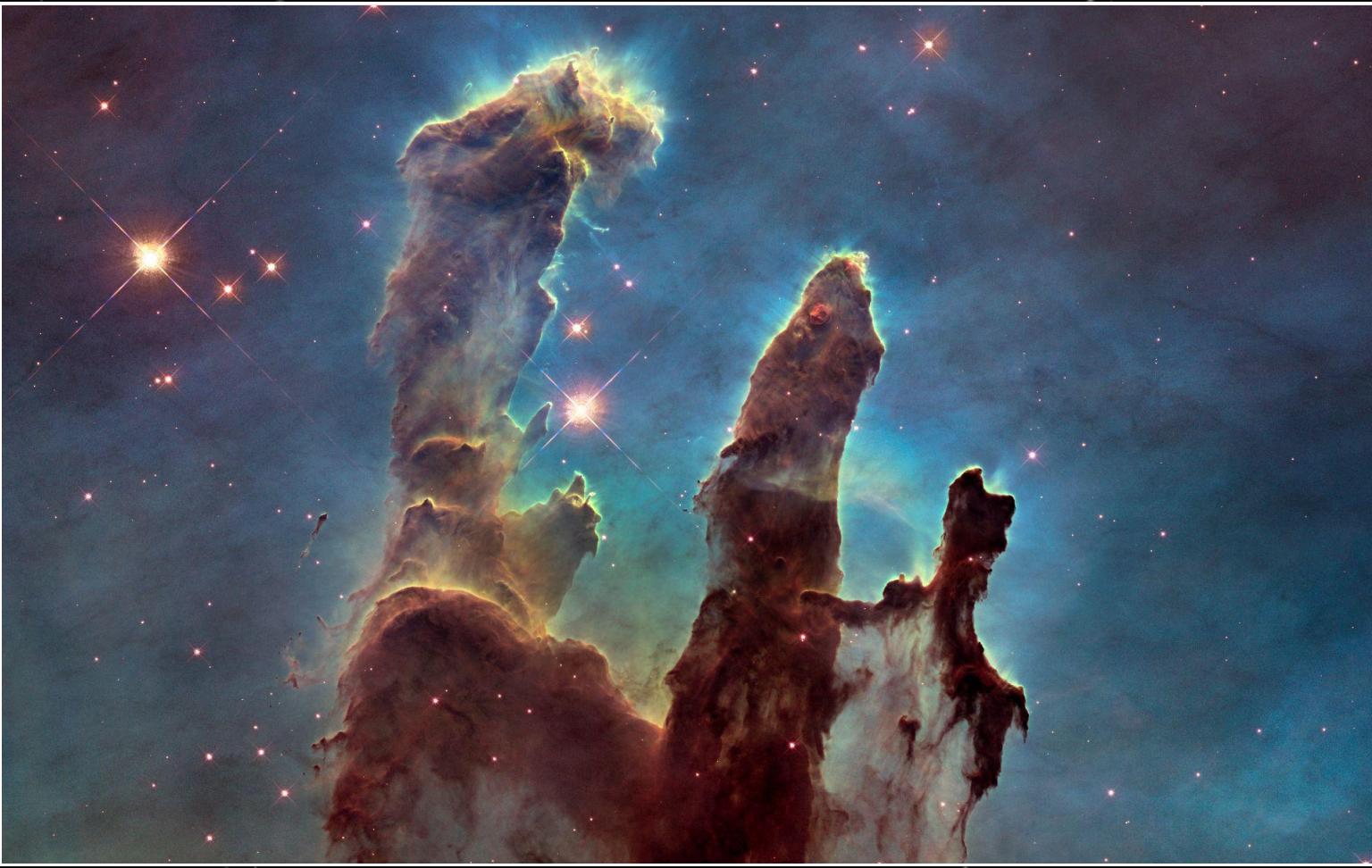
"A DIVE INTO THE LIFE AND DEATH OF A STAR."



But fuel doesn't last forever. And when the core hydrogen runs low, things change. Small stars, like our Sun, puff up into red giants — bloating so large the Sun could swallow Earth's orbit whole. Imagine the calm suburban parent suddenly rolling up in a flaming red sports car. Massive stars, meanwhile, skip straight to chaos. They burn hotter, fusing heavier and heavier elements — carbon, oxygen, silicon — racing toward the inevitable.



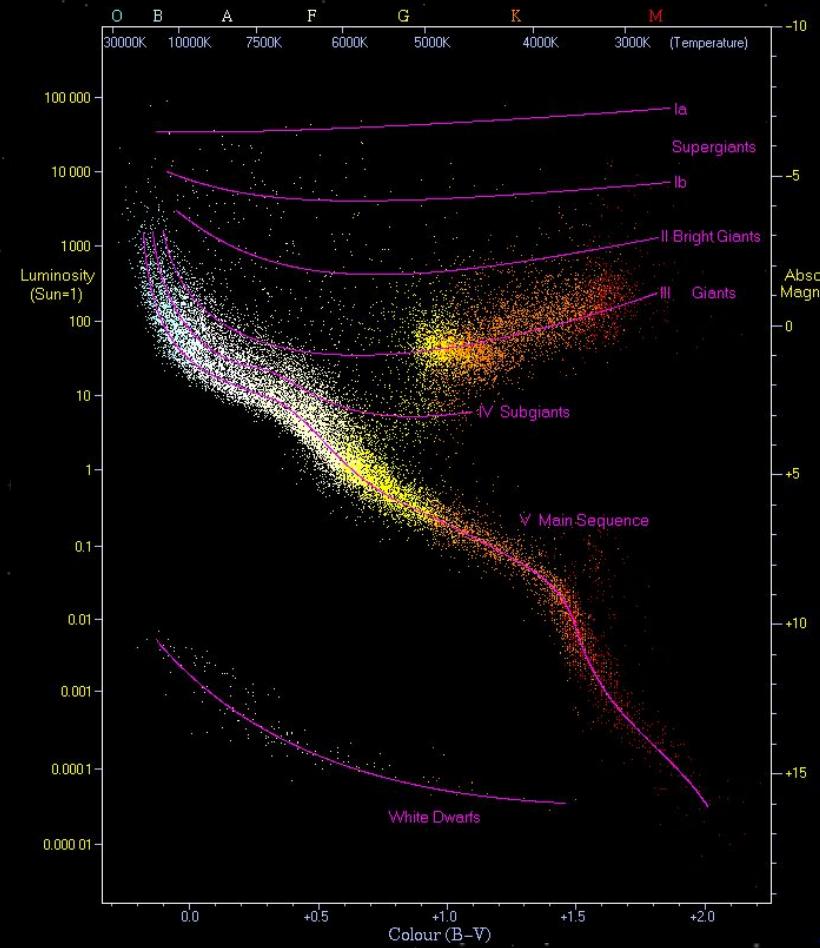
The Life & Death Of a Star



**CHAPTER
01**

Childhood





**Middle
Age**

**CHAPTER
02**

CHAPTER 03

Midlife Crisis

Red Giant Sun

12.5 billion years

*Habitable
zone*

Earth

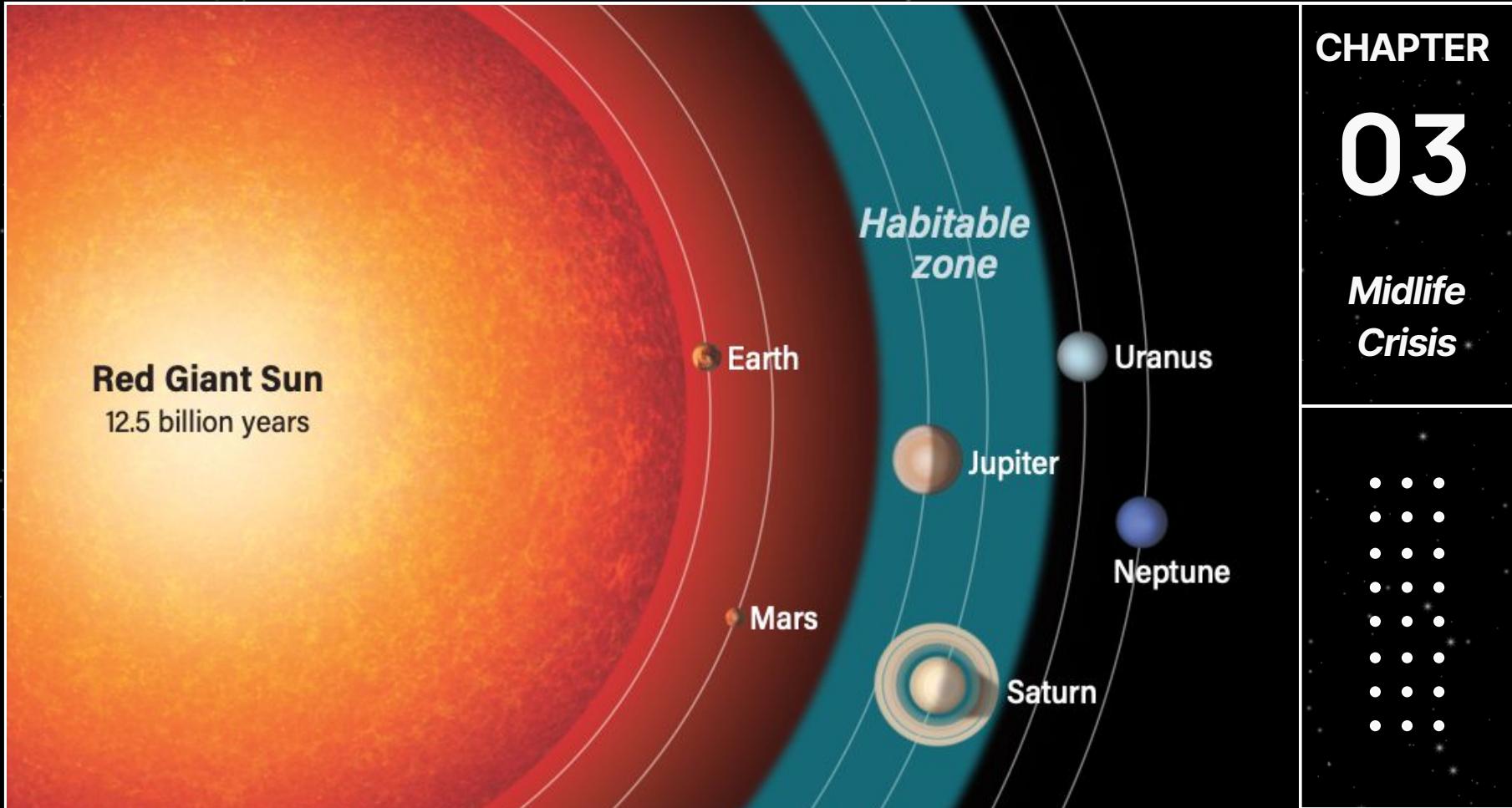
Mars

Uranus

Jupiter

Neptune

Saturn

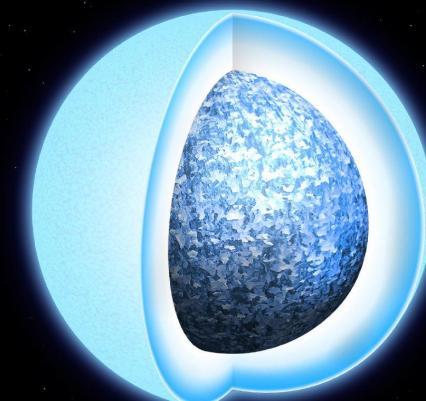


CHAPTER 04

*The
Grand
Finale*



*Small
Stars*





CHAPTER

04

*The
Grand
Finale*



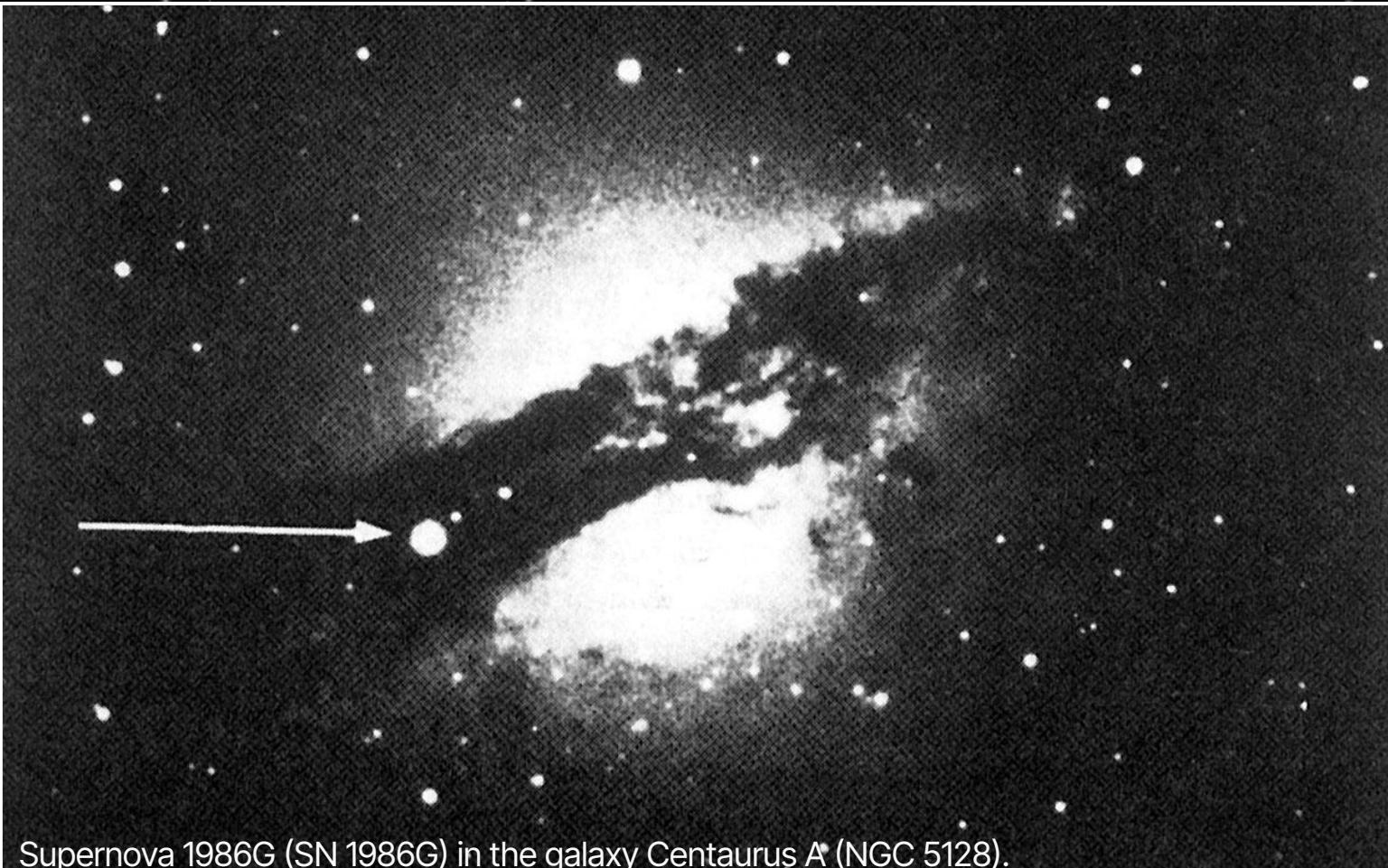
*The
Big
Boys*

CHAPTER 04

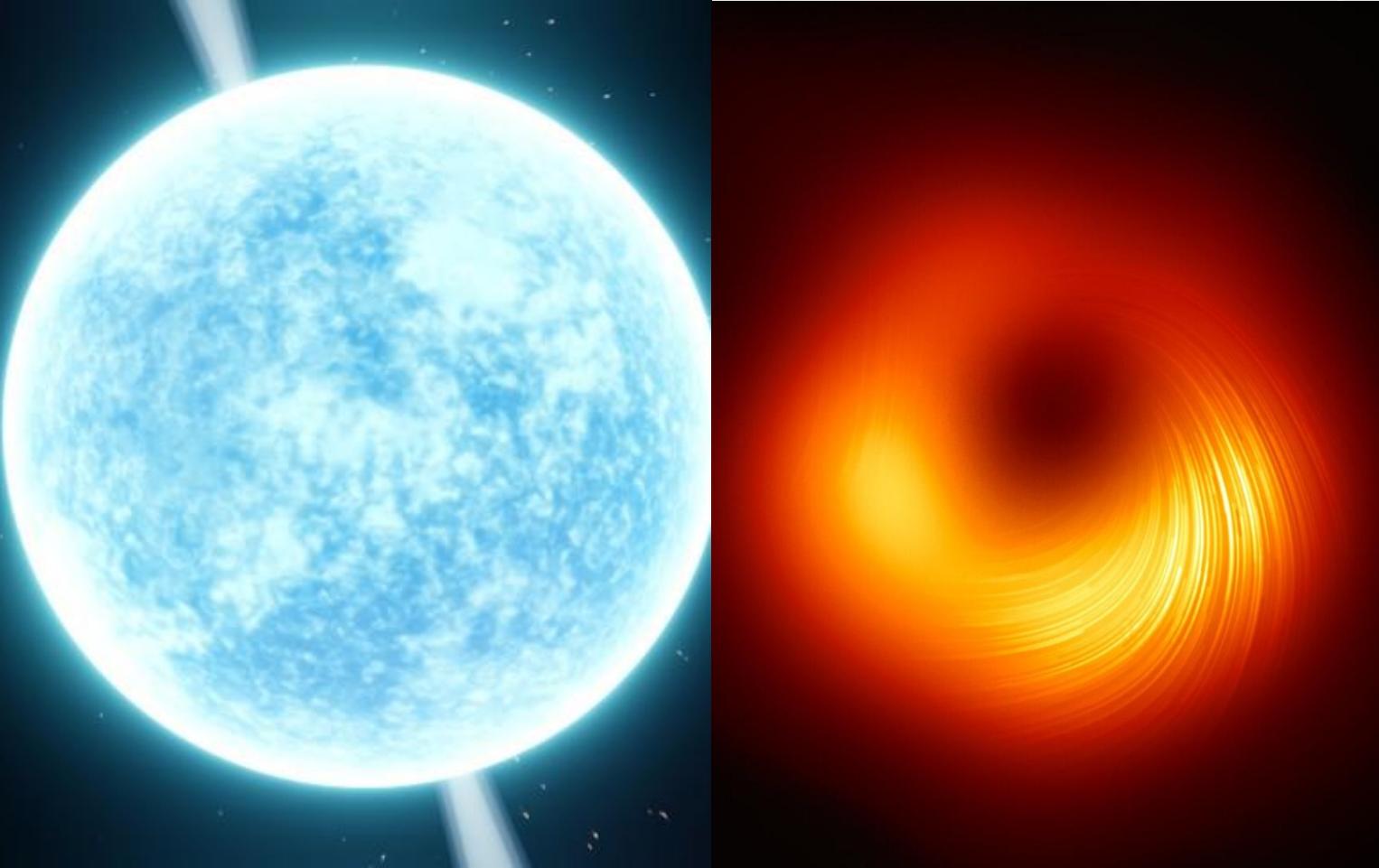
*The
Grand
Finale*



*The
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Boys*



Supernova 1986G (SN 1986G) in the galaxy Centaurus A (NGC 5128).



CHAPTER

04

*The
Grand
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*The
Big
Boys*



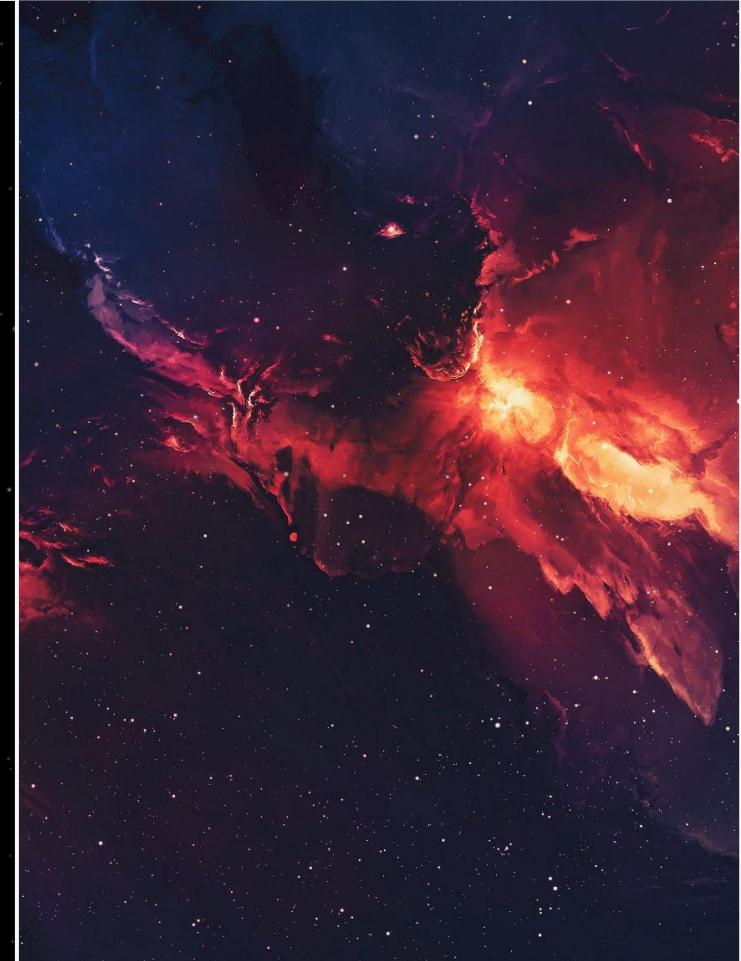
CHAPTER 05

Legacy

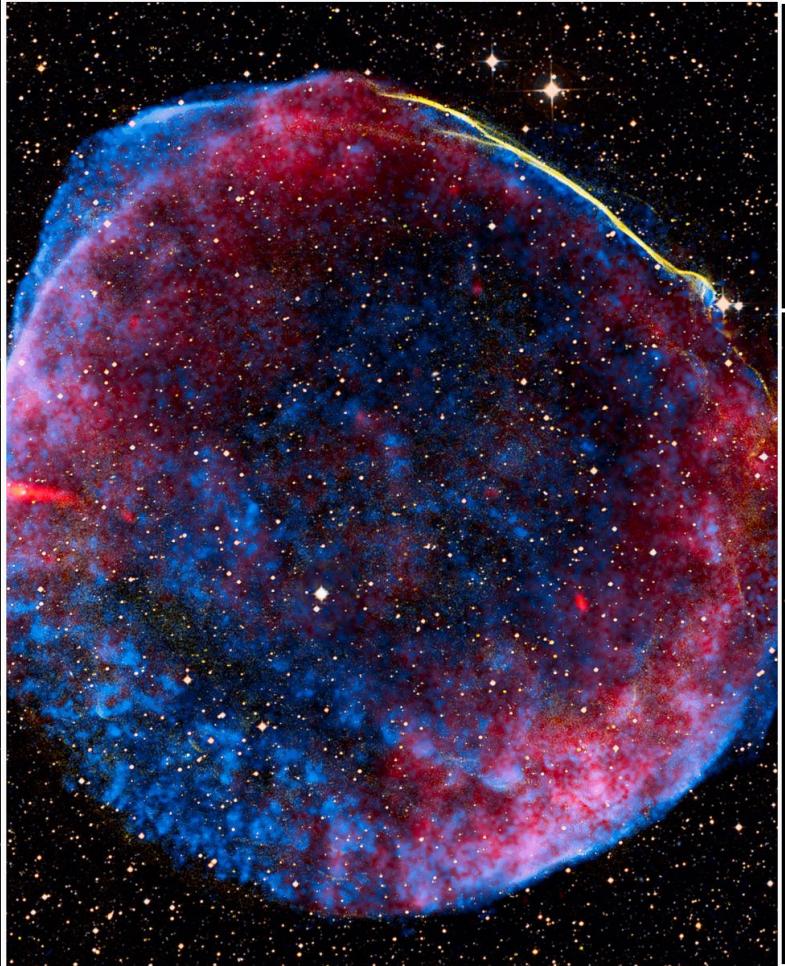


Cosmic Factories

Working overtime.

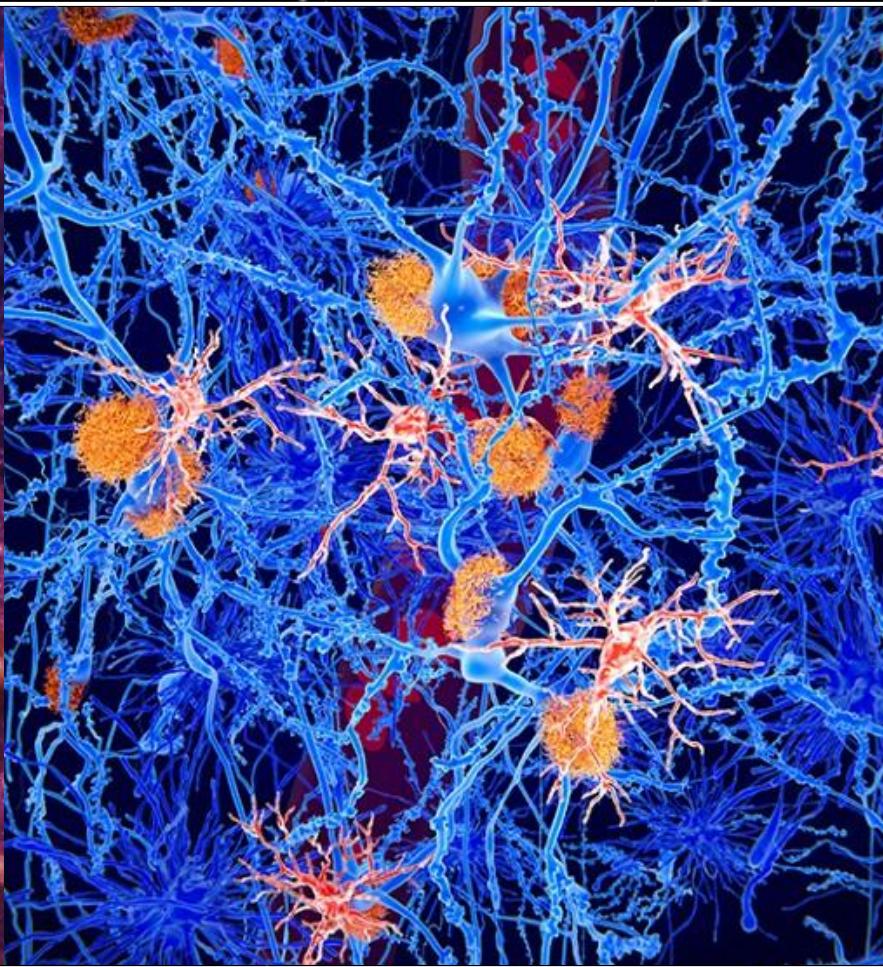
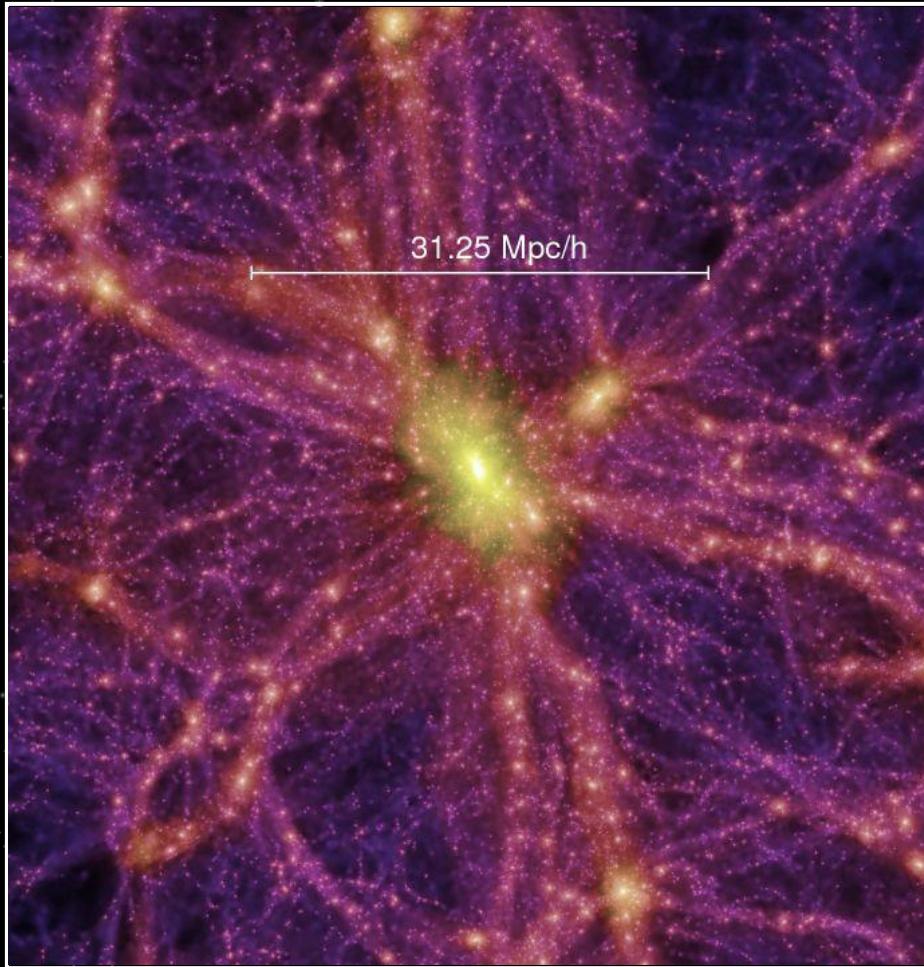


H B		B Big Bang	L Large stars	\$ Super-novae															He B
Li C	Be c		C Cosmic rays	S Small stars	M Man-made														
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Fr \$	Ra \$		La L	Ce L	Pr \$ L	Nd \$ L	Pm \$ L	Sm \$ L	Eu \$	Gd \$	Tb \$	Dy \$	Ho \$	Er \$	Tm \$	Yb \$ L	Lu \$		
			Ac \$	Th \$	Pa \$	U \$	Np \$	Pu \$	Am M	Cm M	Bk M	Cf M	Es M	Fm M	Md M	No M	Lr M		



Stars-R-US

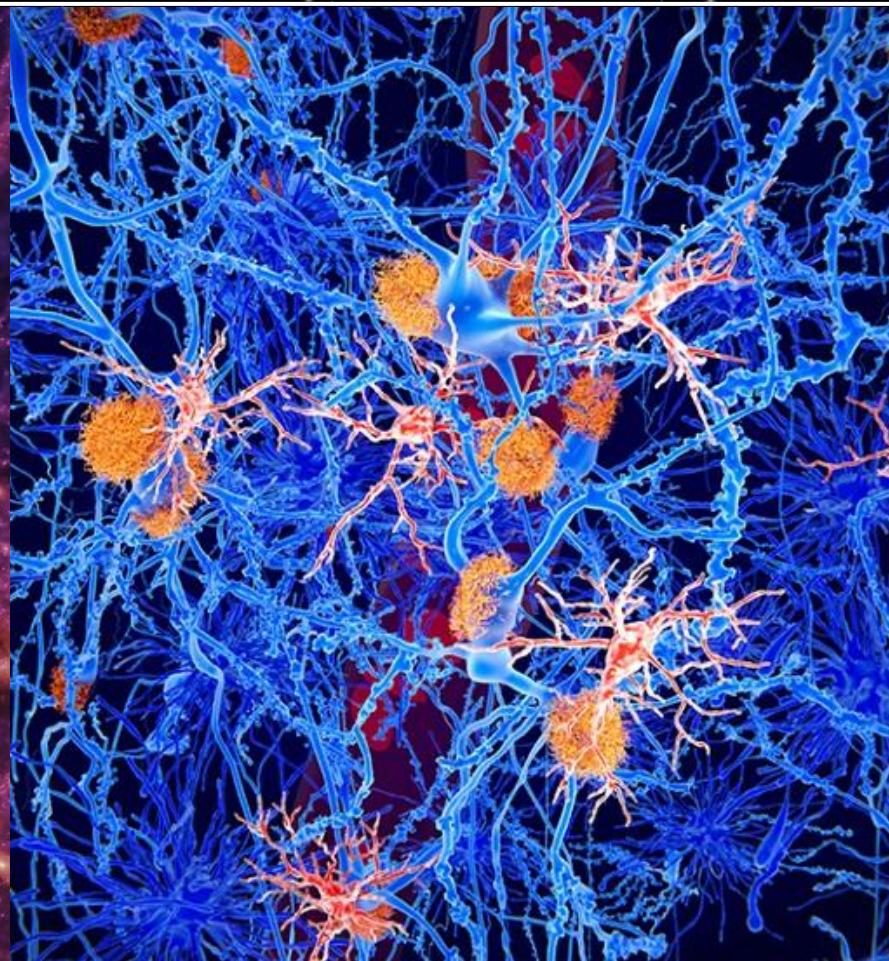
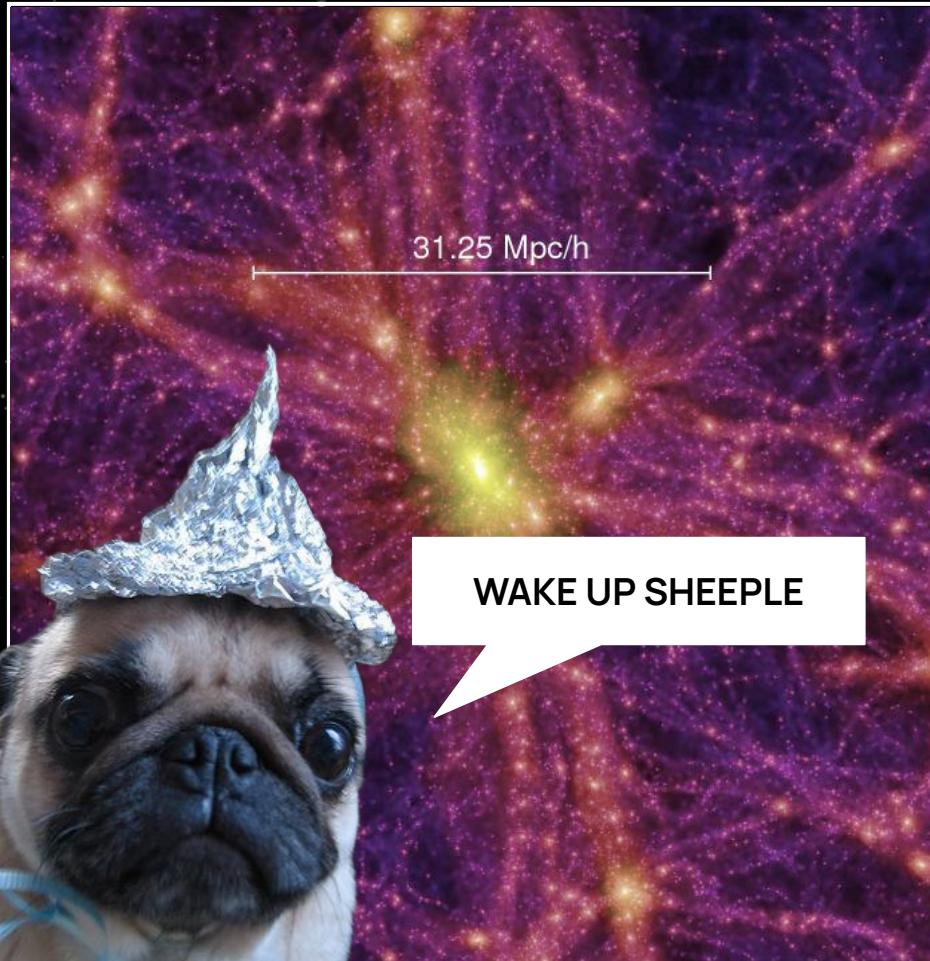


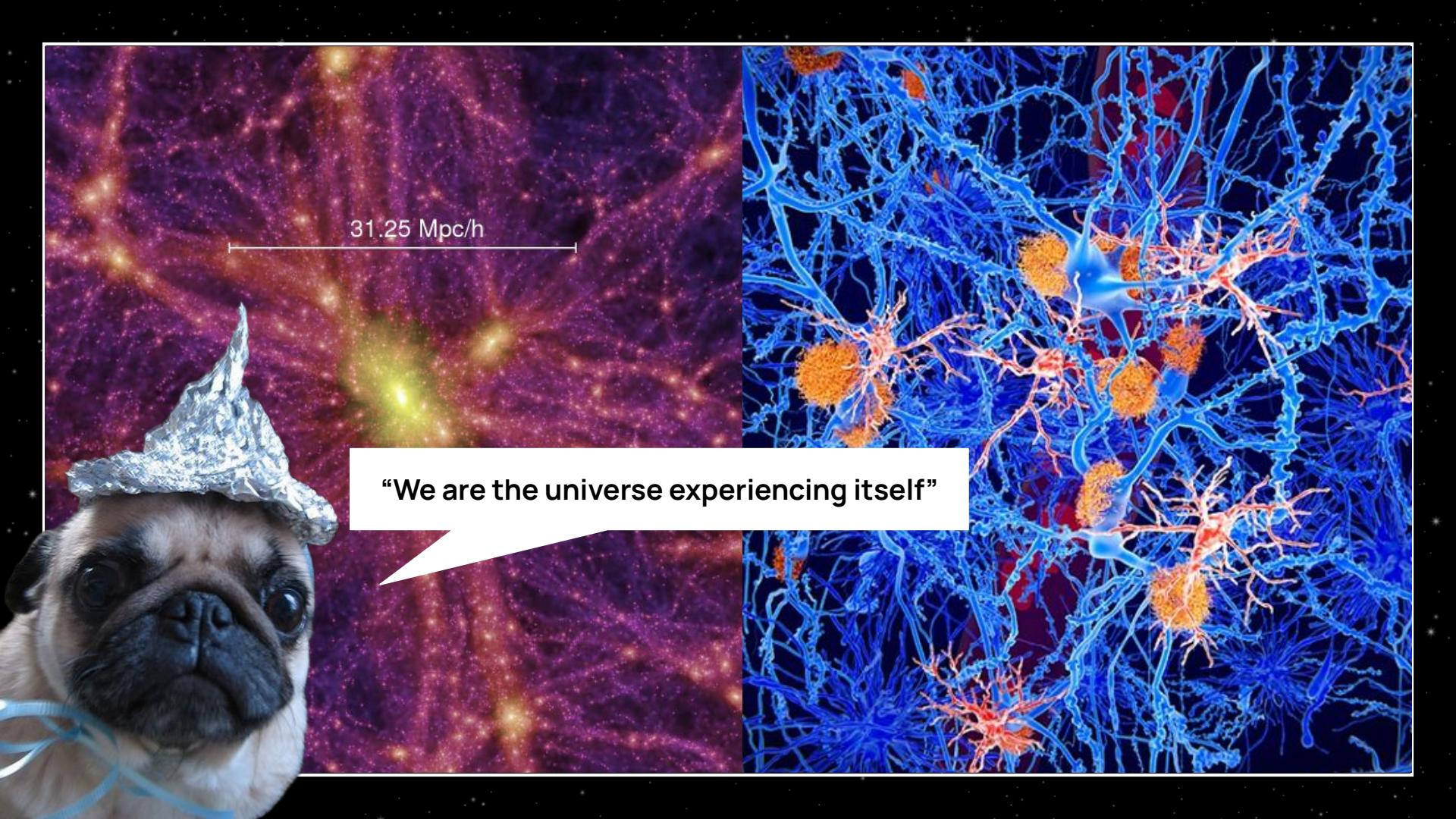




WAKE UP SHEEPLE

31.25 Mpc/h





"We are the universe experiencing itself"



**“You Are My
Stardust”**

