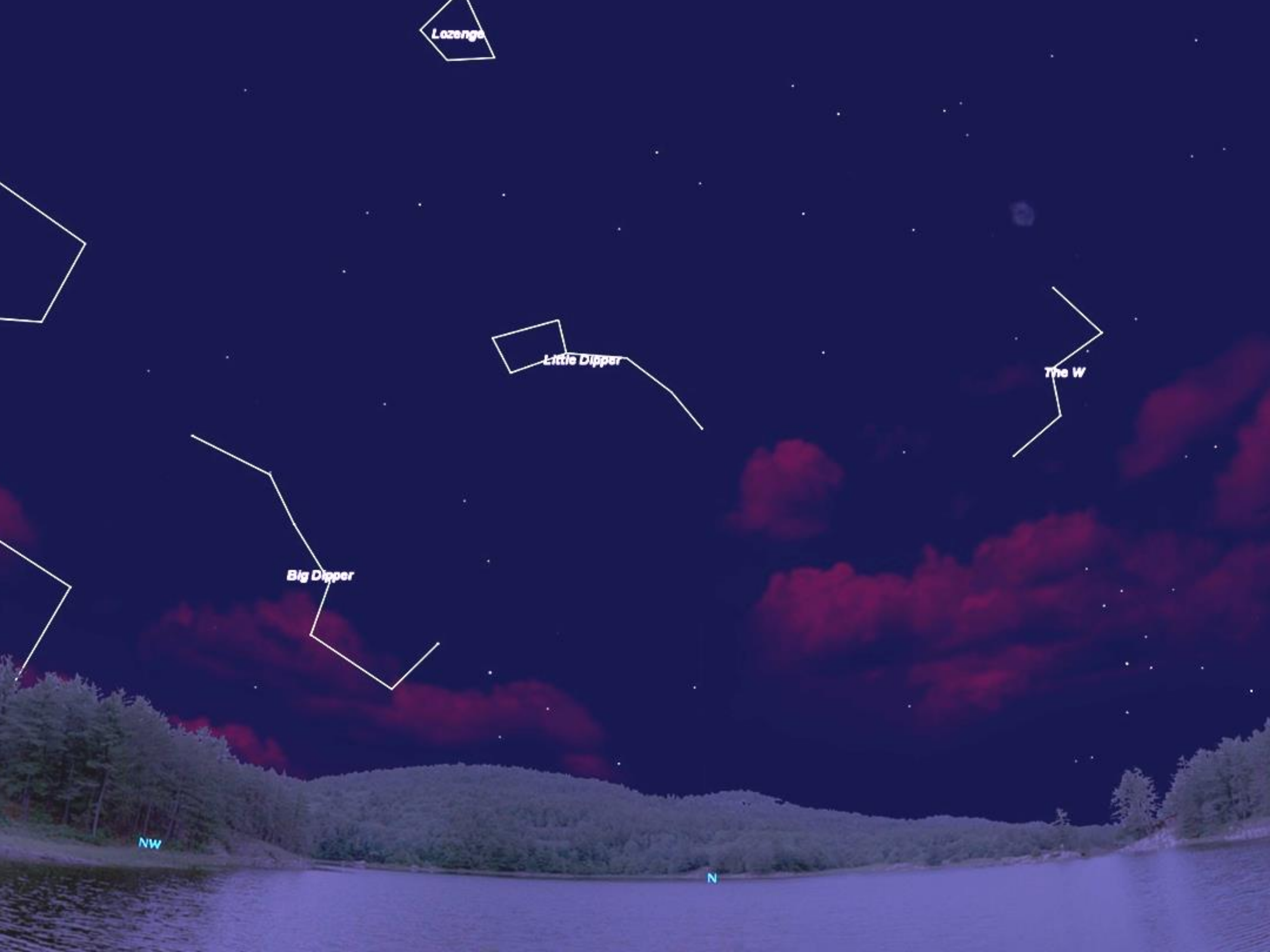
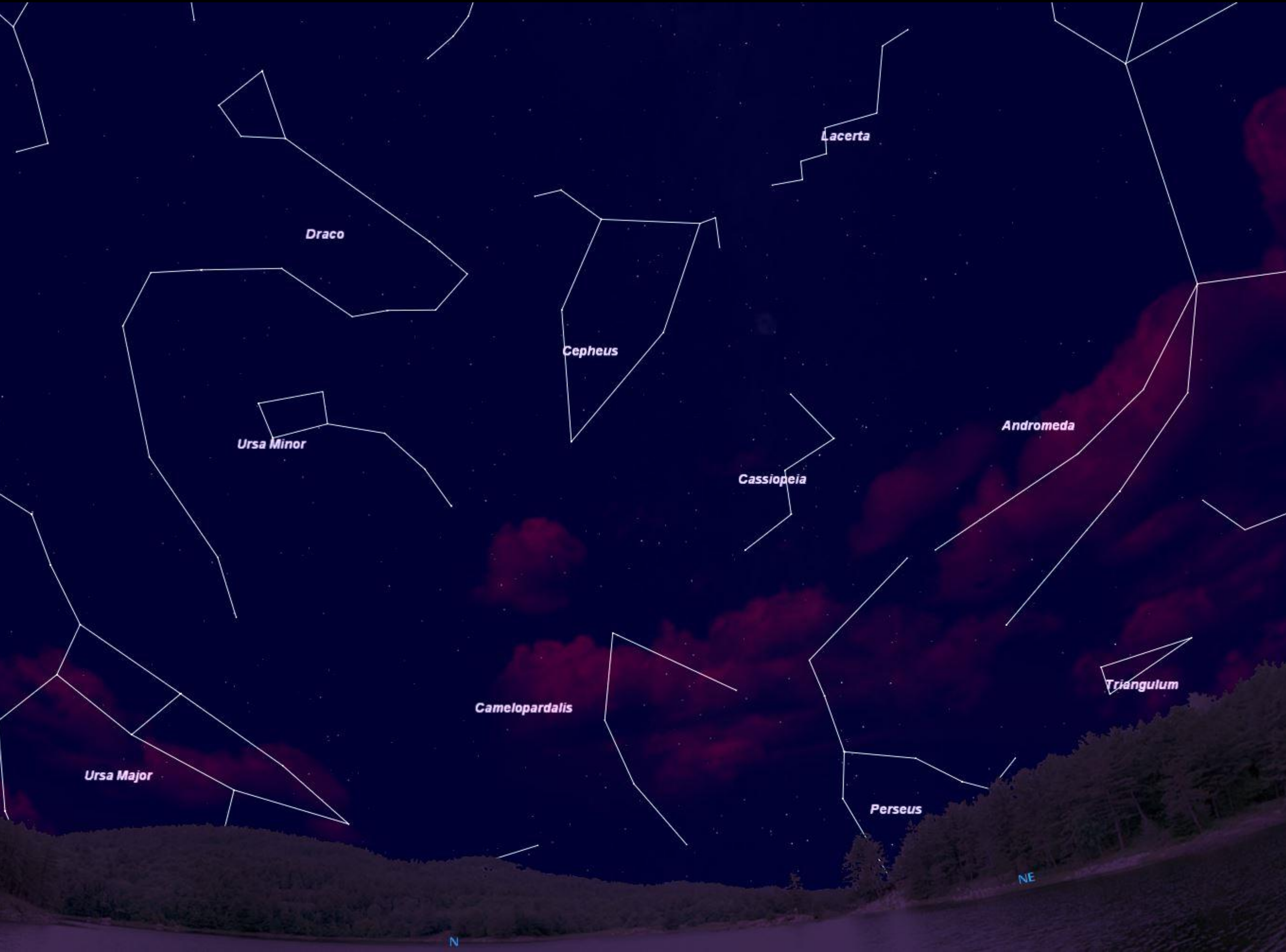
THE NIGHT SKY


NW
N
NE


Hercules
Cygnus
Lacerta
Corona Borealis
Draco
Cepheus
Andromeda
Ursa Minor
Cassiopeia
Canes Venatici
Camelopardalis
Triangulum
Ursa Major
Perseus
NW
N
NE

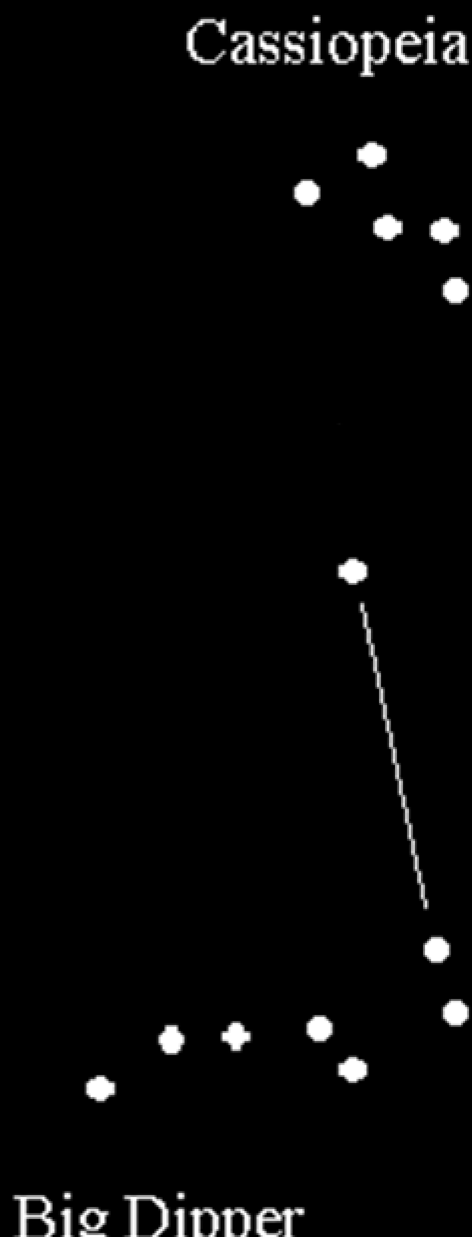


Lozenge
Little Dipper
The W
Big Dipper
NW
N


Lacerta
Draco
Cepheus
Andromeda
Ursa Minor
Cassiopeia
Triangulum
Camelopardalis
Ursa Major
Perseus
NE
N

Finding the North Star

- The North Star is not an especially bright star
- There are not a lot of stars near it that are bright enough to confuse the observer.
- Asterisms that are easily found serve as pointers.


Cassiopeia
Big Dipper


NW
N
NE

Finding the North Star

Alaska State Flag

Finding Your Way Around the Night Sky

- Star Chart
- Planisphere
- Planetarium programs and apps
- Smart Telescope

The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

NORTHERN HEMISPHERE
MARCH 2016

Sky Calendar – March 2016

Get Sky Calendar on Twitter
http://twitter.com/skymaps

1 **Last Quarter Moon** at 23:11 UT.
2 **Moon near Saturn** (86° from Sun, morning sky) at 7h UT. Mag. +0.5.
7 **Moon near Venus** (23° from Sun, morning sky) at 9h UT. Mag. –3.9.
8 **Moon near Mercury** (13° from Sun, morning sky) at 3h UT. Mag. –0.6.
8 **Jupiter at opposition** at 11h UT. Best time to observe the largest planet in the solar system. Mag. –2.6.
9 **New Moon** at 1:54 UT. Start of lunation 1153.
9 **Total Solar Eclipse** along a path from Indonesia to across the Pacific Ocean. Greatest eclipse at 1:57 UT. Partial eclipse visible from SE Asia, China, Japan, and parts of Australia.
10 **Moon at perigee** (closest to Earth) at 7h UT (359,510 km; angular size 33.2').
13 **Moon near the Pleiades** (evening sky) at 21h UT.
14 **Moon very near Aldebaran** (evening sky) at 14h UT. Occultation visible from central Asia.
15 **First Quarter Moon** at 17:03 UT.
18 **Moon near Beehive cluster** (evening sky) at 23h UT.
20 **Vernal equinox** at 4:30 UT. The time when the Sun reaches the point along the ecliptic where it crosses into the northern celestial hemisphere marking the start of spring in the Northern Hemisphere and autumn in the Southern Hemisphere.
20 **Moon near Regulus** (evening sky) at 18h UT.
22 **Moon near Jupiter** (evening sky) at 3h UT. Mag. –2.5.
23 **Penumbral Lunar Eclipse** from 9:39 to 13:55 UT, mid-eclipse at 11:47 UT. Just visible around mid-eclipse.
23 **Full Moon** at 12:01 UT.
25 **Moon near Spica** (morning sky) at 5h UT.
25 **Moon at apogee** (farthest from Earth) at 14h UT (distance 406,125 km; angular size 29.4').
28 **Moon near Mars** (morning sky) at 20h UT. Mag. –0.4.
29 **Moon near Saturn** (morning sky) at 15h UT. Mag. +0.4.
31 **Last Quarter Moon** at 15:17 UT.

More sky events and links at http://Skymaps.com/skycalendar/

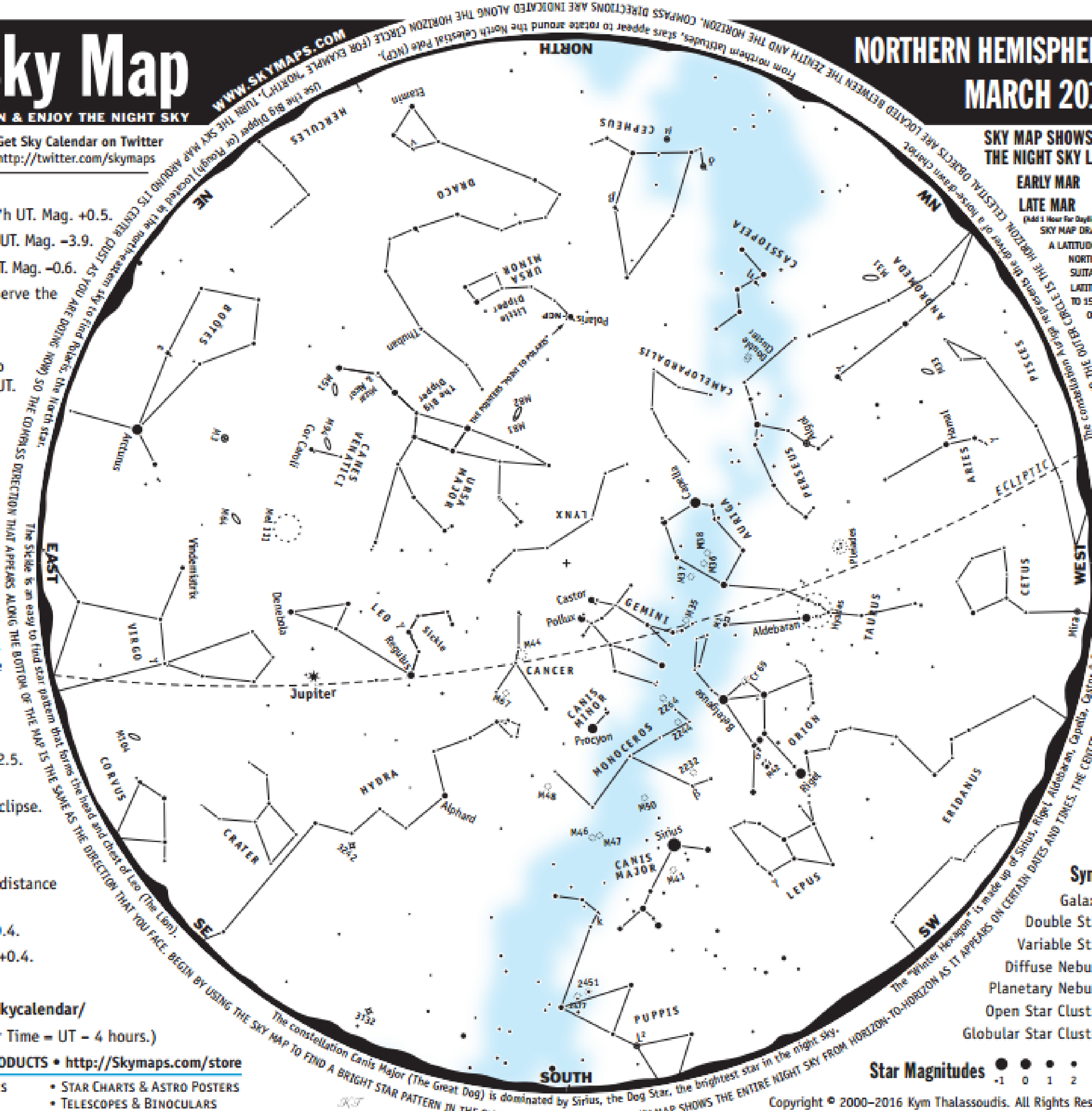
All times in Universal Time (UT). (USA Eastern Summer Time = UT – 4 hours.)

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY MAR	9 PM
LATE MAR	8 PM

(Add 1 Hour for Daylight Saving)

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

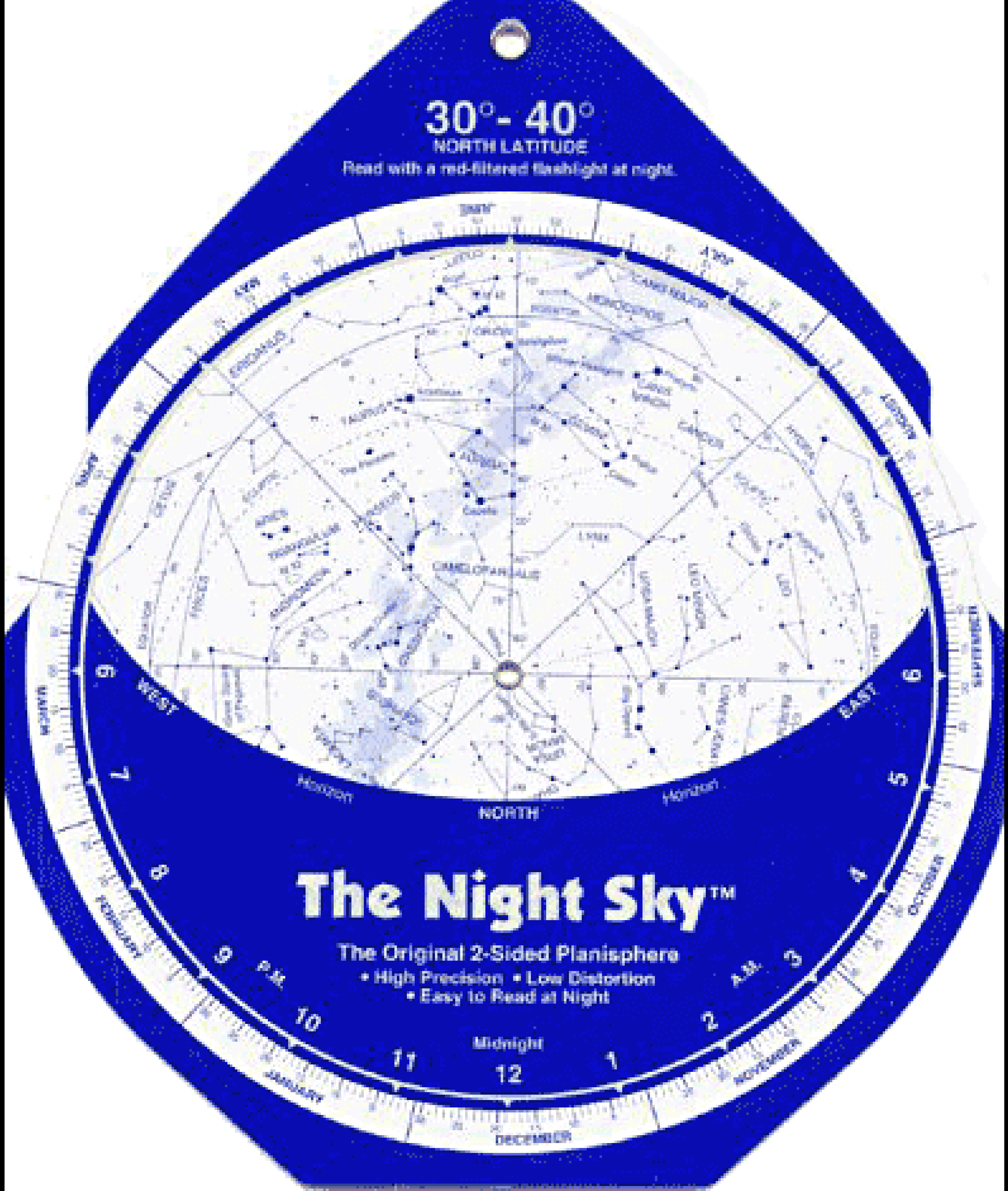


Symbols

Galaxy	⊘
Double Star	•
Variable Star	⊙
Diffuse Nebula	□
Planetary Nebula	✧
Open Star Cluster	◌
Globular Star Cluster	⊕

Star Magnitudes -1 0 1 2 3 4

INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH) AND THE OUTER CIRCLE IS THE HORIZON. CELESTIAL OBJECTS ARE LOCATED BETWEEN THE ZENITH AND THE HORIZON. COMPASS DIRECTIONS ARE INDICATED ALONG THE HORIZON CIRCLE (FOR EXAMPLE "NORTH"). TURN THE SKY MAP AROUND ITS CENTER (JUST AS YOU ARE DOING NOW) SO THE COMPASS DIRECTION THAT APPEARS ALONG THE BOTTOM OF THE MAP IS THE SAME AS THE DIRECTION THAT YOU FACE. BEGIN BY USING THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY.



30°- 40°
NORTH LATITUDE
Read with a red-filtered flashlight at night.
WEST
EAST
NORTH
Horizon
Horizon
The Night Sky™
The Original 2-Sided Planisphere
• High Precision • Low Distortion
• Easy to Read at Night
P.M.
A.M.
Midnight
6 7 8 9 10 11 12 1 2 3 4 5 6
MARCH
FEBRUARY
JANUARY
DECEMBER
NOVEMBER
OCTOBER
SEPTEMBER

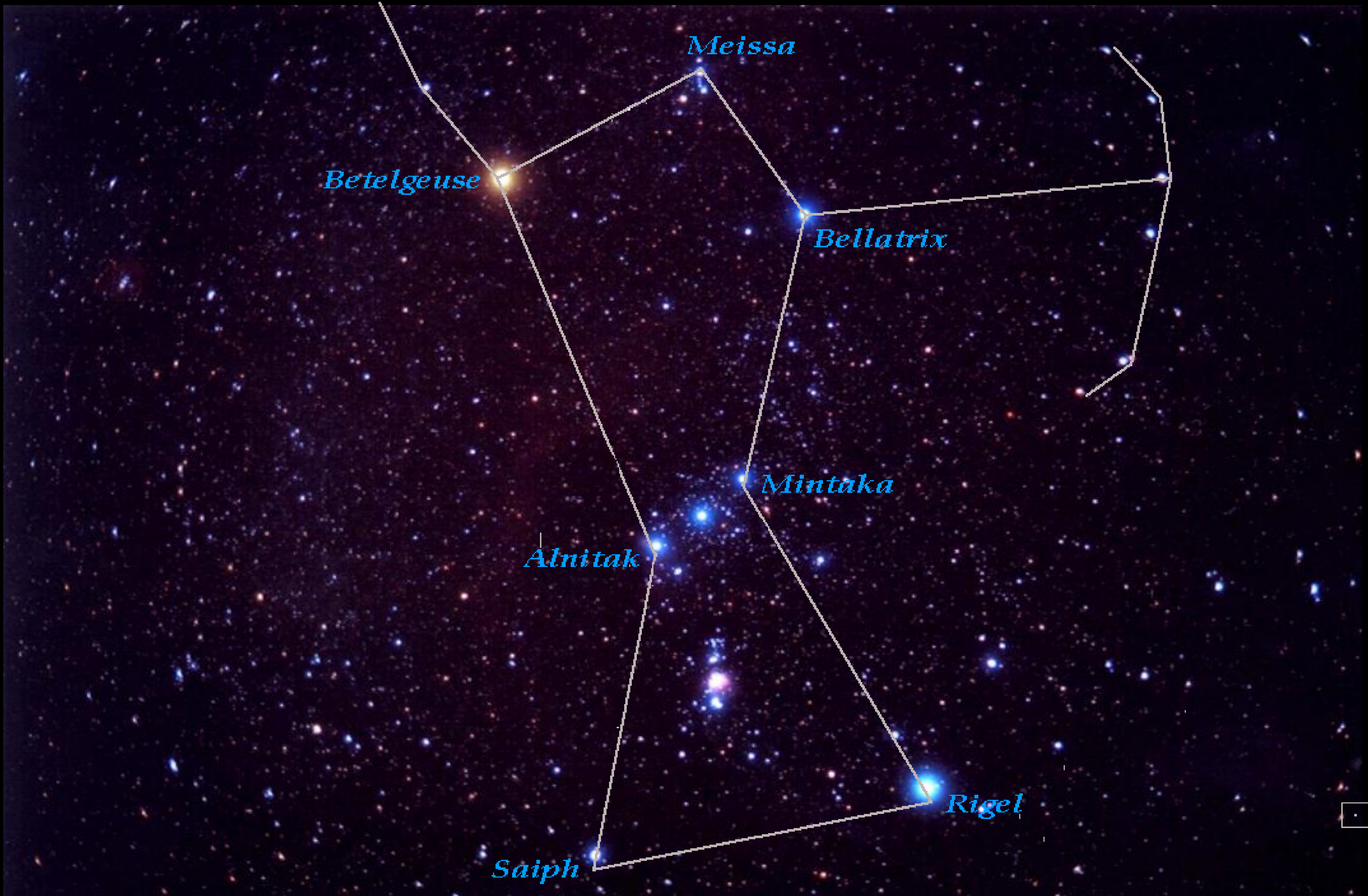

Google Sky Map
MOTOROLA
You found:
Jupiter
SAMSUNG
OK
verizon


Advanced GT
NexStar
ALIGN
ENTER
UNDO
M 1
CALD 2
MENU 3
NGC 4
PLANET 5
UP 6
STAR 7
LIST 8
DOWN 9
INFO
TOUR 0
RATE
CELESTRON


ORION
ORION

Constelations

- Arbitrary Designations
- 88 Modern constellations
- Northern Constellations are named after Greet Myths with Latin Names
- Southern Constellation named by early Mariners
- Although the stars are all moving, they are so far apart that the basic patterns have stayed the same over the last few thousand years.
- If seen three dimensionally, the patterns no longer exist.

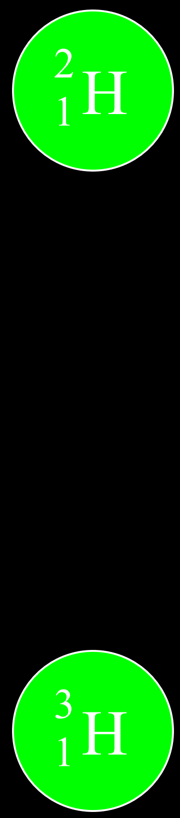

Meissa
Betelgeuse
Bellatrix
Mintaka
Alnitak
Rigel
Saiph

STARS

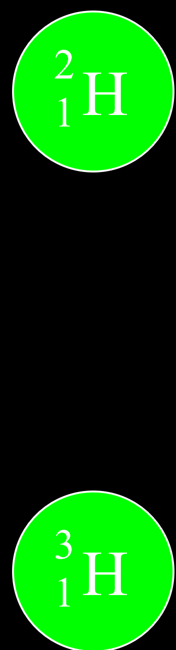
Where does our Sun and all other stars get energy?

Nuclear Fusion

The Fusion Process



The Fusion Process



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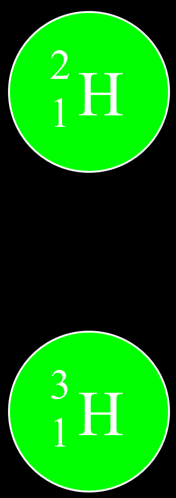
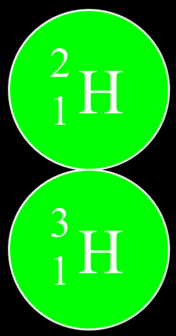
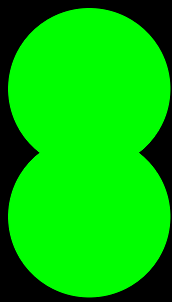


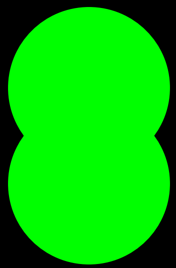
The Fusion Process



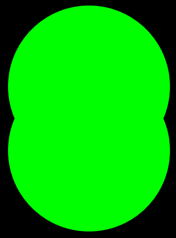
The Fusion Process



The Fusion Process



The Fusion Process



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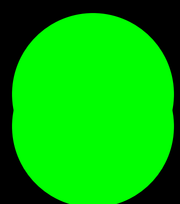
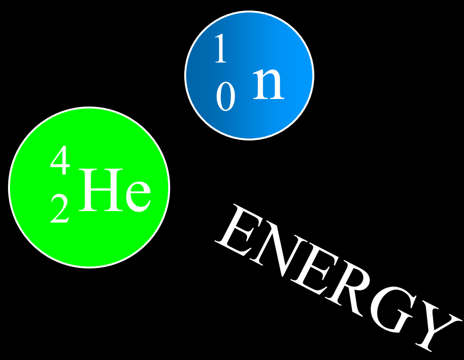
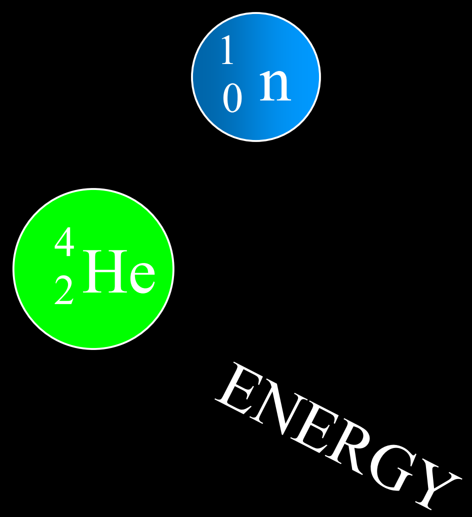


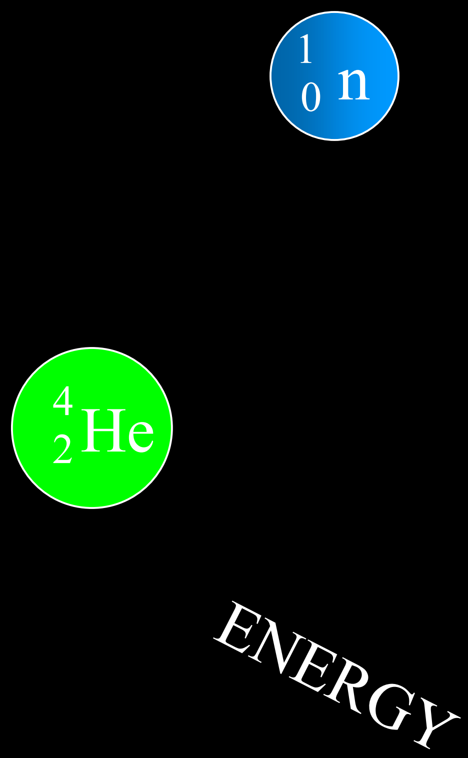
The Fusion Process



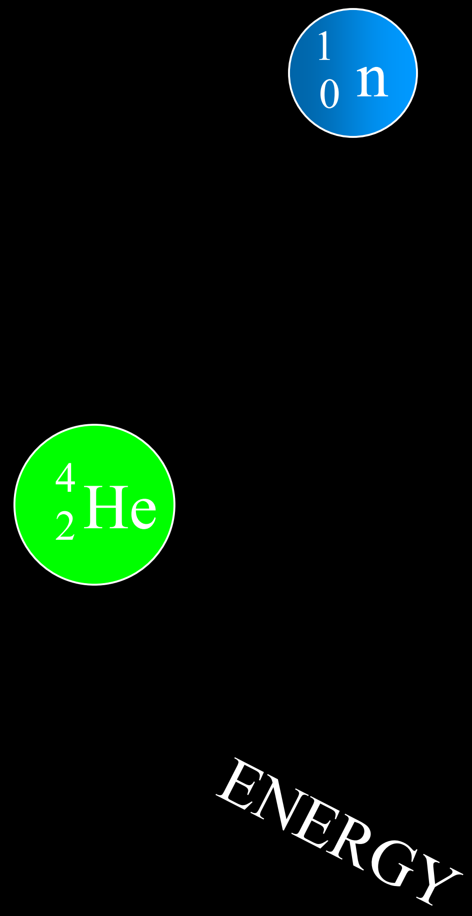
The Fusion Process



The Fusion Process



The Fusion Process



E = MC²

Energy (E) is equal to Mass (m) multiplied by the Speed of Light (c) squared

- This tells us that a <u>small amount of mass can be converted into a very large</u> <u>amount of energy</u> because the speed of light (c) is an extremely large number

- When Hydrogen Fuses into Helium, a small amount of mass is converted to energy.

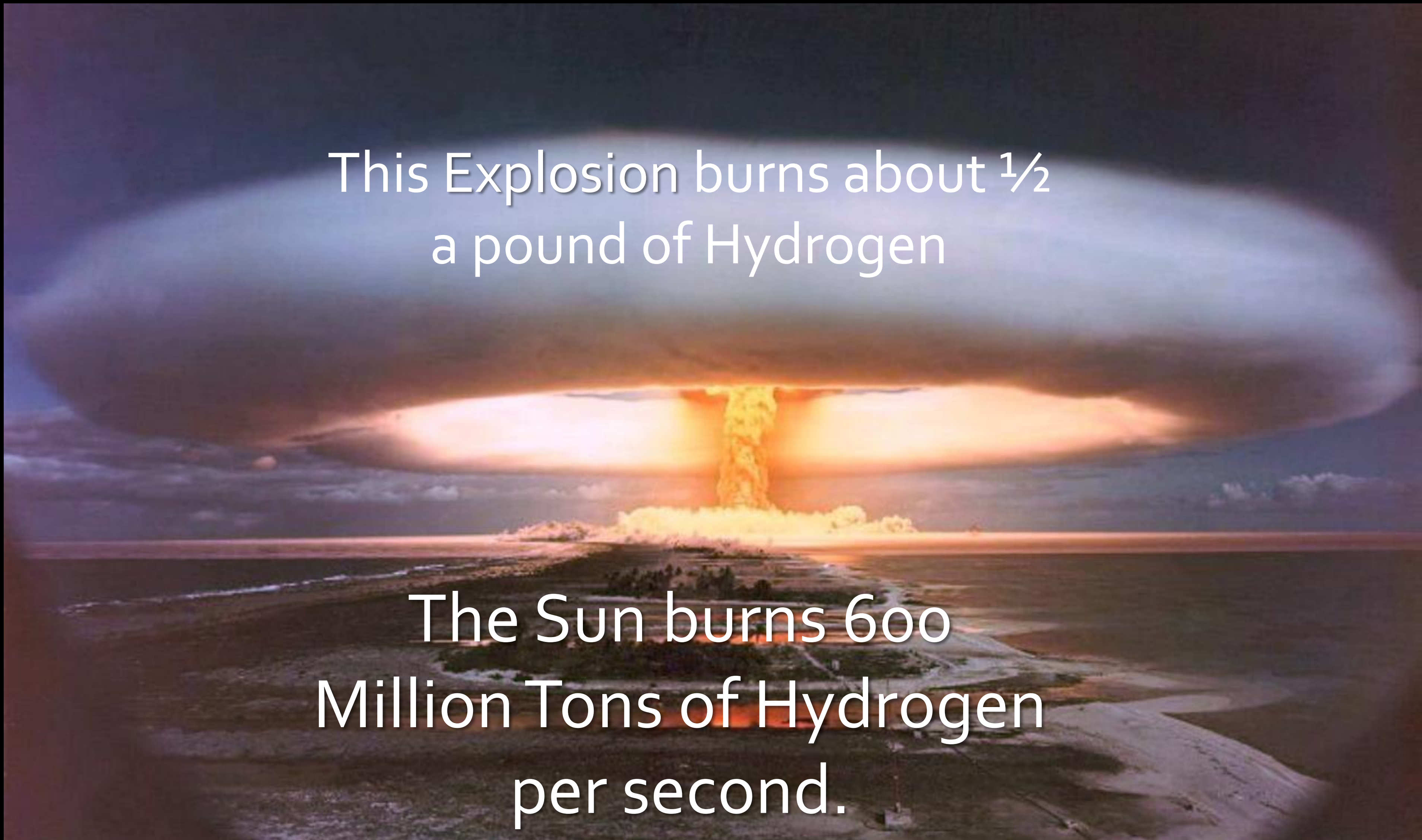

This Explosion burns about ½
a pound of Hydrogen
The Sun burns 600
Million Tons of Hydrogen
per second.

Table of Elements

6 Carbon C

Atomic Number (Number of Protons)

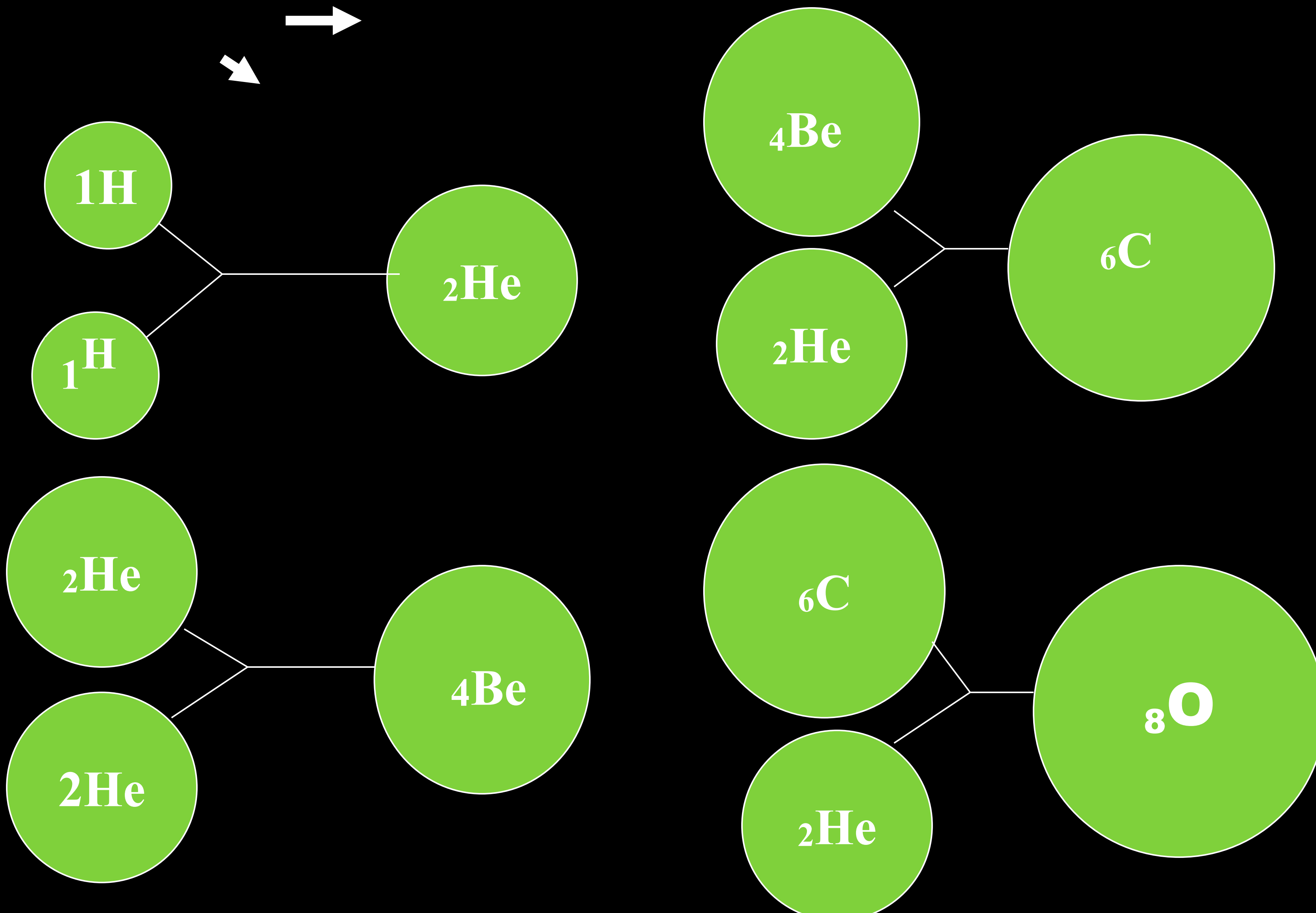
Chemical Name

Chemical Symbol

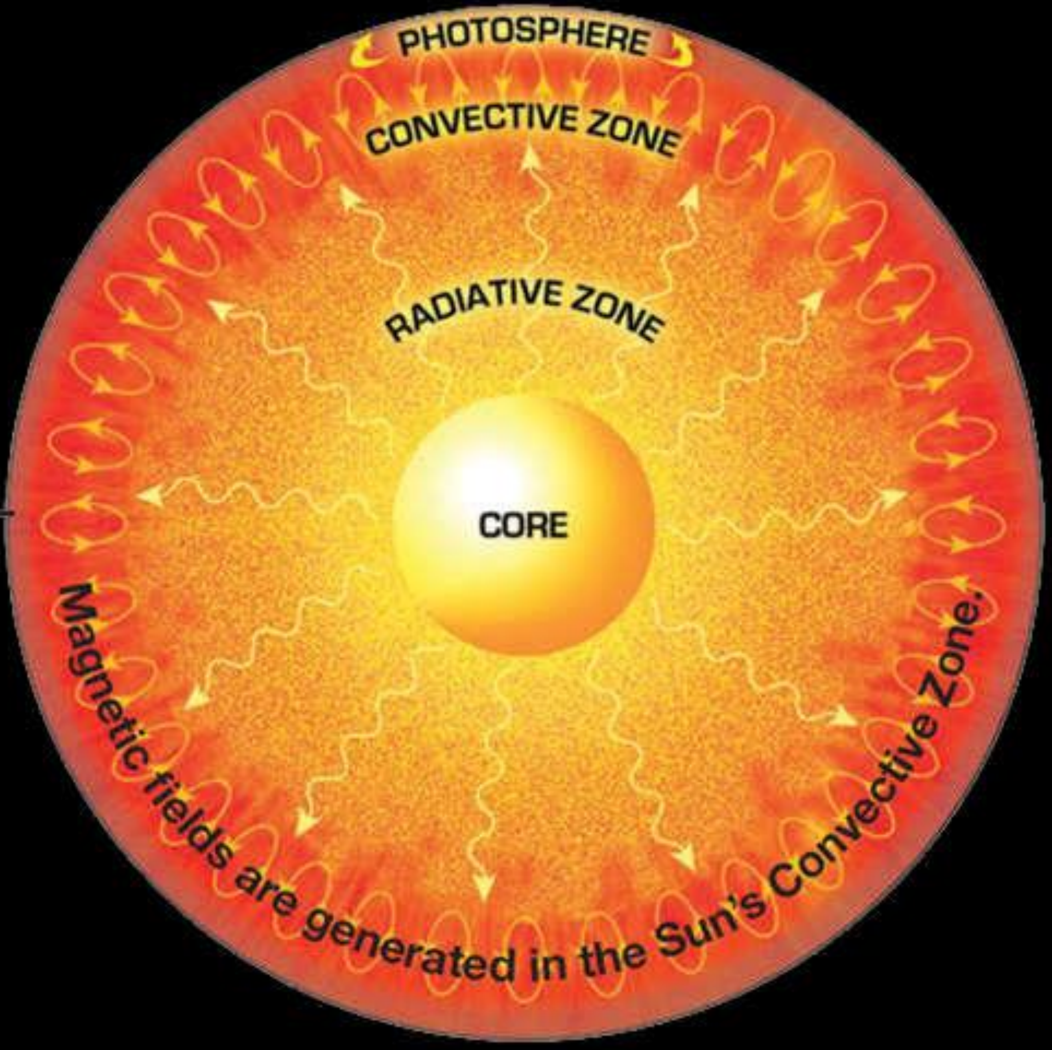
1 Hydrogen H																	2 Helium He
3 Lithium Li	4 Beryllium Be											5 Boron B	6 Carbon C	7 Nitrogen N	8 Oxygen O	9 Fluorine F	10 Neon Ne
11 Sodium Na	12 Magnesium Mg											13 Aluminum Al	14 Silicon Si	15 Phosphorus P	16 Sulfur S	17 Chlorine Cl	18 Argon Ar
19 Potassium K	20 Calcium Ca	21 Scandium Sc	22 Titanium Ti	23 Vanadium V	24 Chromium Cr	25 Manganese Mn	26 Iron Fe	27 Cobalt Co	28 Nickel Ni	29 Copper Cu	30 Zinc Zn	31 Gallium Ga	32 Germanium Ge	33 Arsenic As	34 Selenium Se	35 Bromine Br	36 Krypton Kr
37 Rubidium Rb	38 Strontium Sr	39 Yttrium Y	40 Zirconium Zr	41 Niobium Nb	42 Molybdenum Mo	43 Technetium Tc	44 Ruthenium Ru	45 Rhodium Rh	46 Palladium Pd	47 Silver Ag	48 Cadmium Cd	49 Indium In	50 Tin Sn	51 Antimony Sb	52 Tellurium Te	53 Iodine I	54 Xenon Xe
55 Cesium Cs	56 Barium Ba	57-71 *	72 Hafnium Hf	73 Tantalum Ta	74 Tungsten W	75 Rhenium Re	76 Osmium Os	77 Iridium Ir	78 Platinum Pt	79 Gold Au	80 Mercury Hg	81 Thallium Tl	82 Lead Pb	83 Bismuth Bi	84 Polonium Po	85 Astatine At	86 Radon Rn
87 Francium Fr	88 Radium Ra	89-103 **	104 Rutherfordium Rf	105 Dubnium Db	106 Seaborgium Sg	107 Bohrium Bh	108 Hassium Hs	109 Meitnerium Mt	110 Darmstadtium Ds	111 Roentgenium Rg	112 Ununbium Uub	113 Ununtrium Uut	114 Ununquadium Uuq	115 Ununpentium Uup	116 Ununhexium Uuh	117 Ununseptium Uus	118 Ununoctium Uuo

*	57 Lanthanum La	58 Cerium Ce	59 Praseodymium Pr	60 Neodymium Nd	61 Promethium Pm	62 Samarium Sm	63 Europium Eu	64 Gadolinium Gd	65 Terbium Tb	66 Dysprosium Dy	67 Holmium Ho	68 Erbium Er	69 Thulium Tm	70 Ytterbium Yb	71 Lutetium Lu
**	89 Actinium Ac	90 Thorium Th	91 Protactinium Pa	92 Uranium U	93 Neptunium Np	94 Plutonium Pu	95 Americium Am	96 Curium Cm	97 Berkelium Bk	98 Californium Cf	99 Einsteinium Es	100 Fermium Fm	101 Mendelevium Md	102 Nobelium No	103 Lawrencium Lr

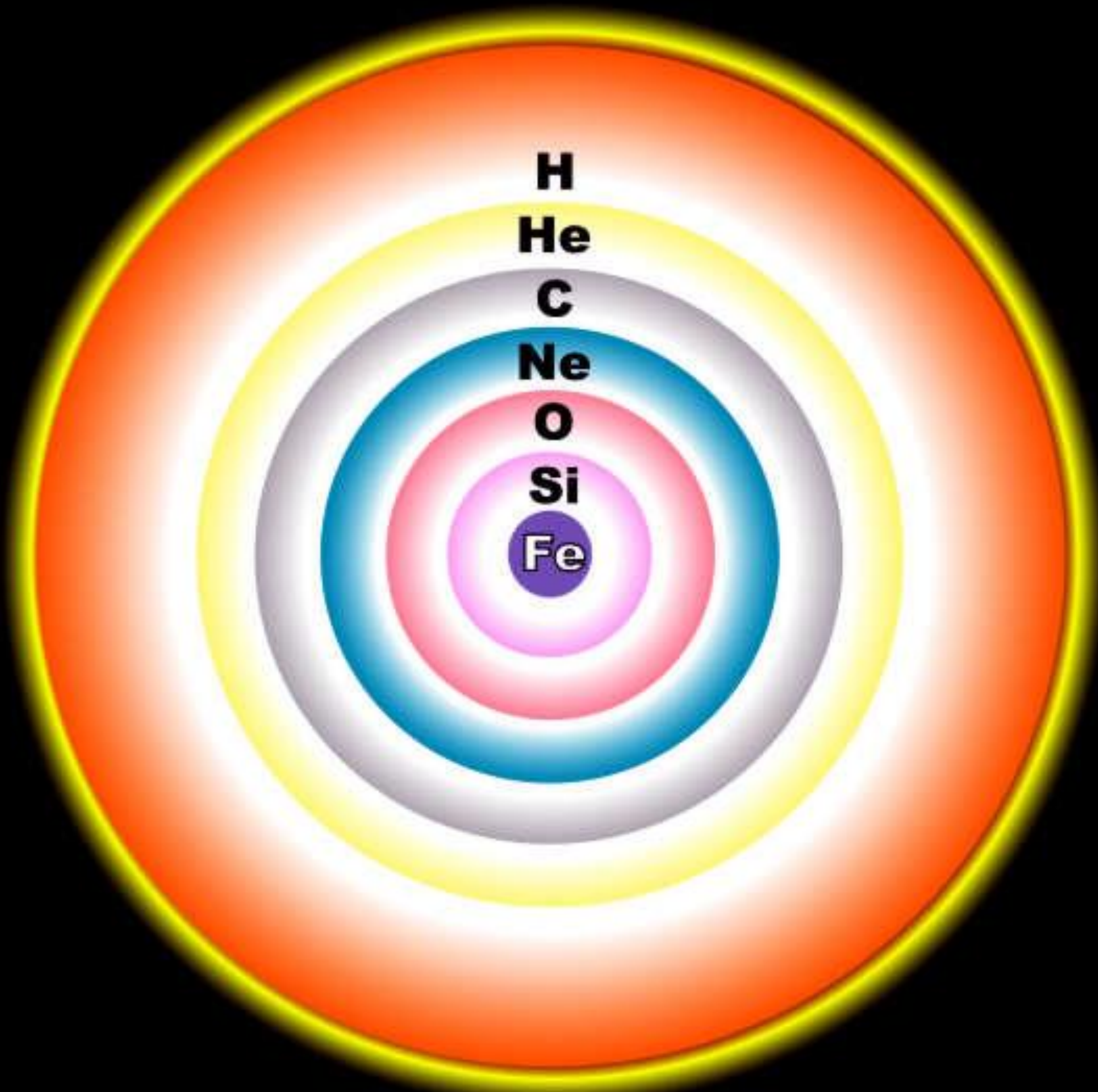
Fusion Reactions

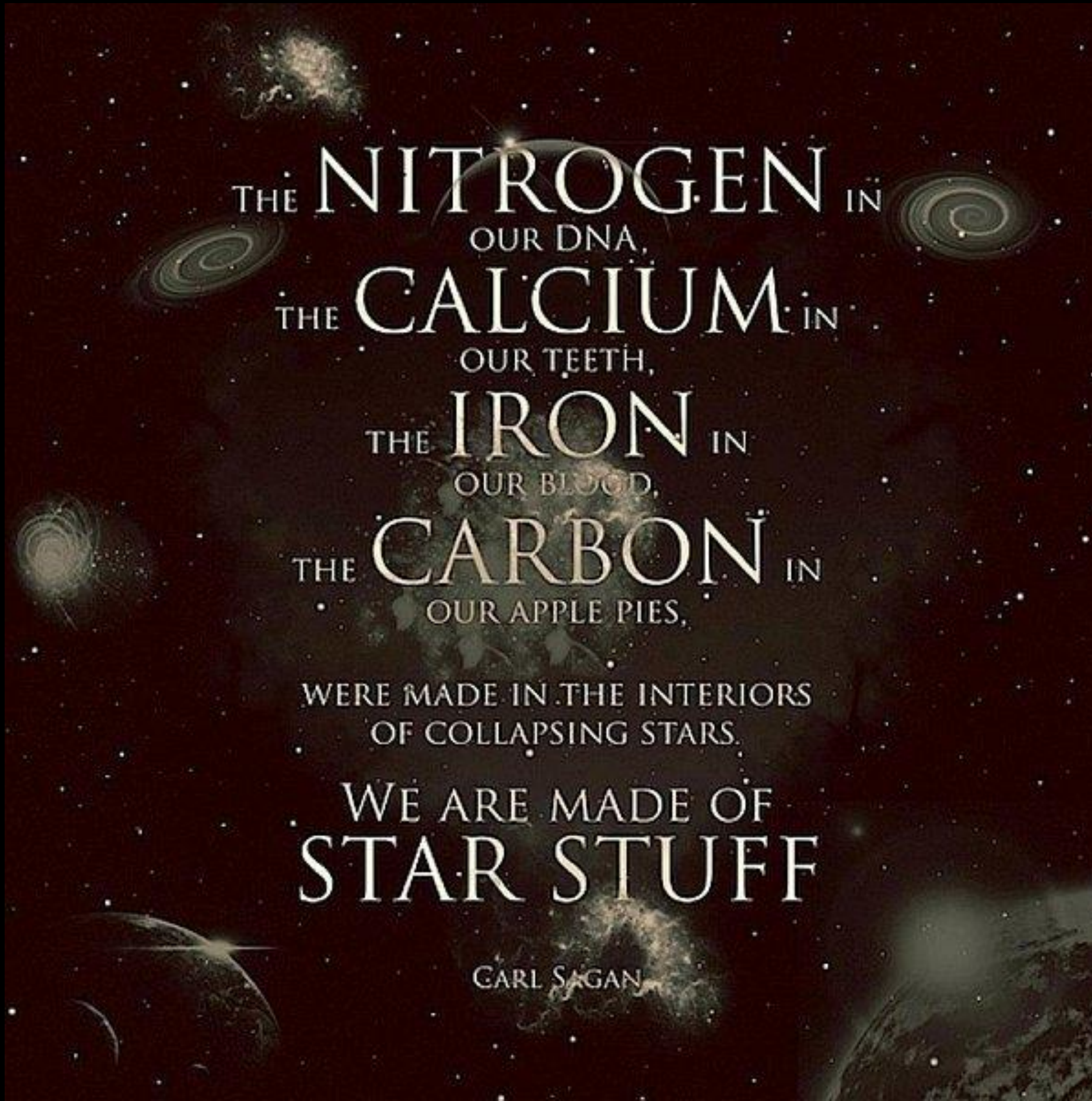


The Interior of the Sun

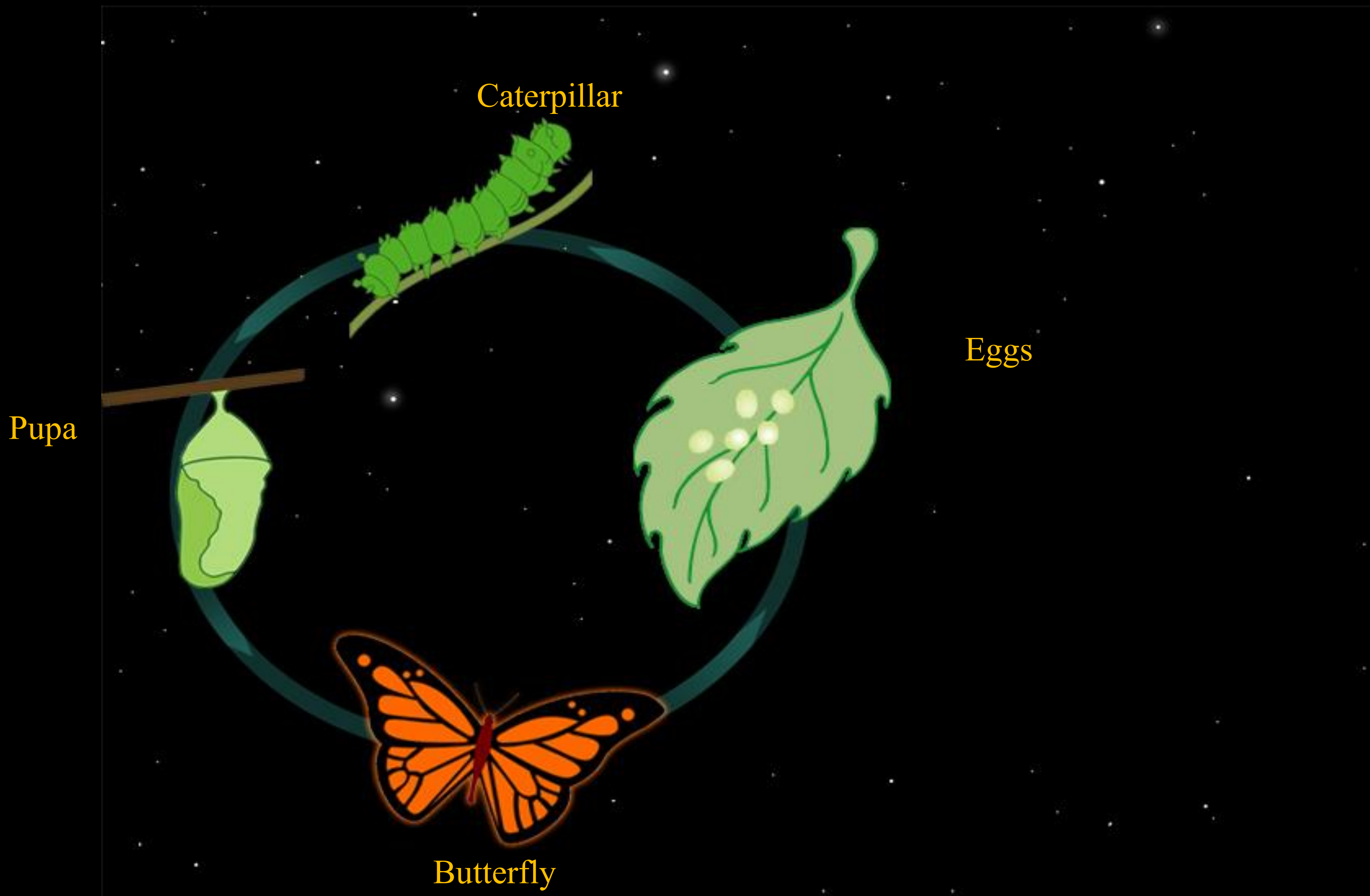


The Interior of an Older Star

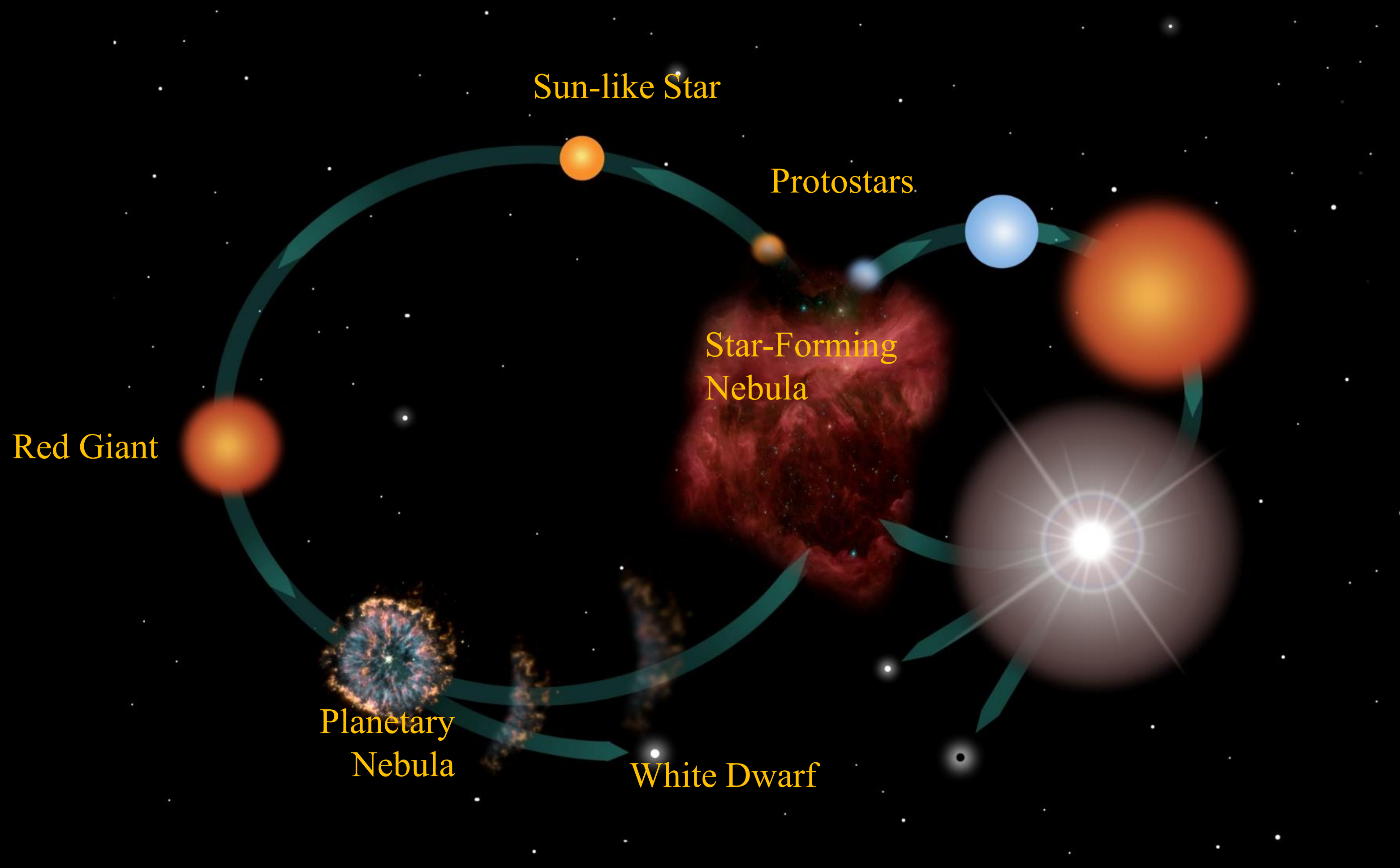



THE NITROGEN IN
OUR DNA,
THE CALCIUM IN
OUR TEETH,
THE IRON IN
OUR BLOOD,
THE CARBON IN
OUR APPLE PIES,
WERE MADE IN THE INTERIORS
OF COLLAPSING STARS.
WE ARE MADE OF
STAR STUFF
CARL SAGAN

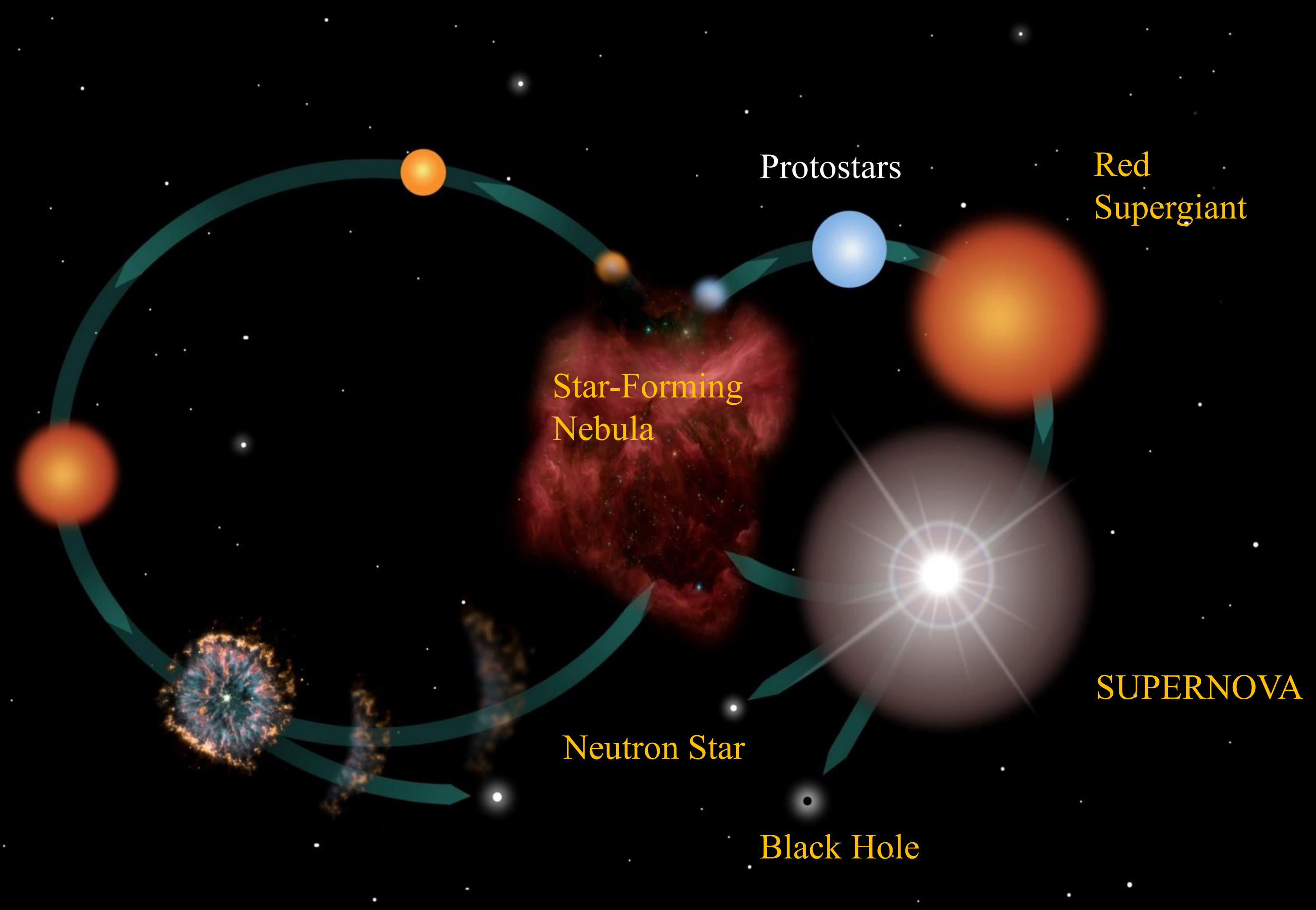
Life of a Butterfly



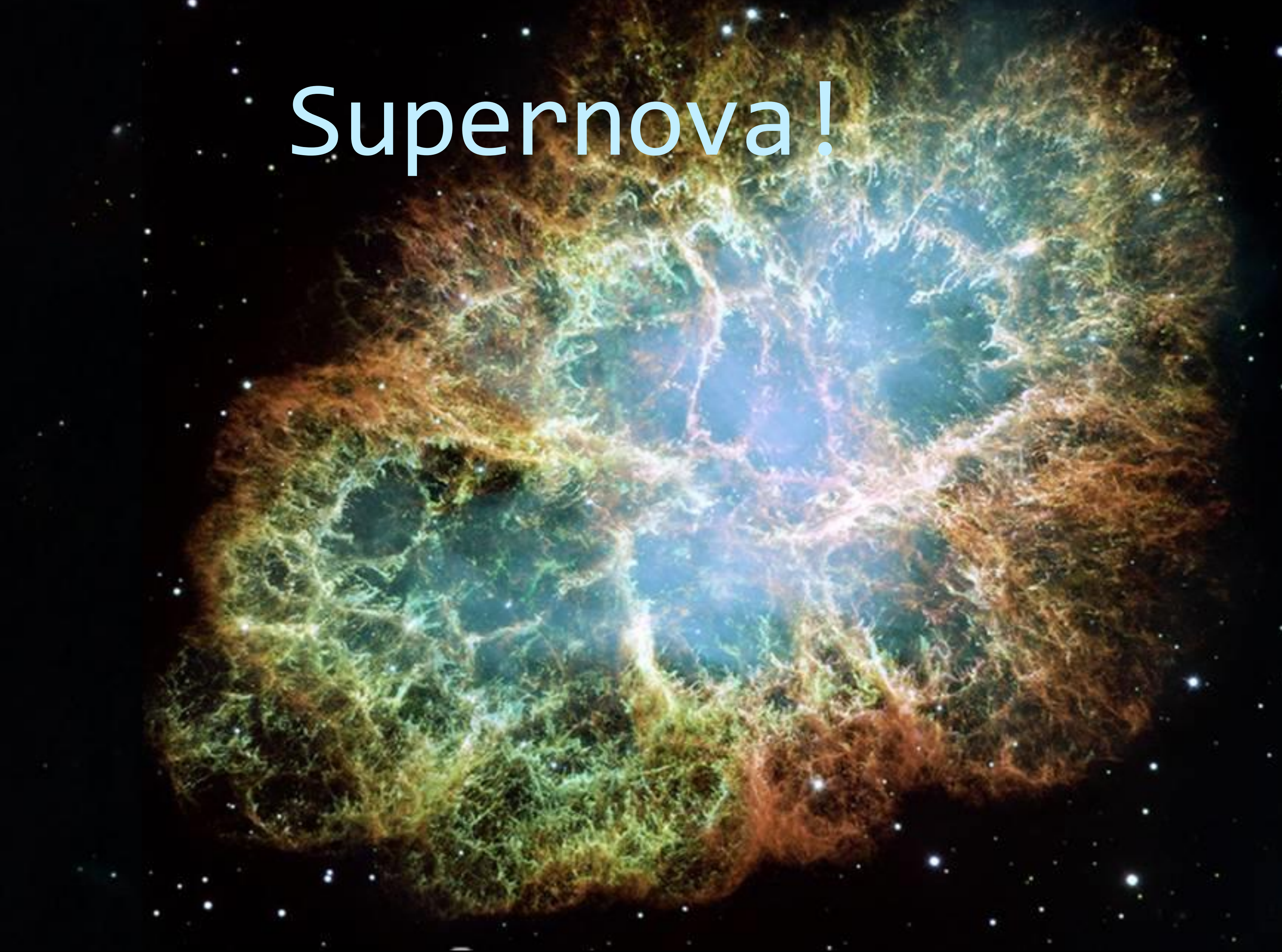
Life of a Sun-like Star



Life of a Massive Star



Supernova!



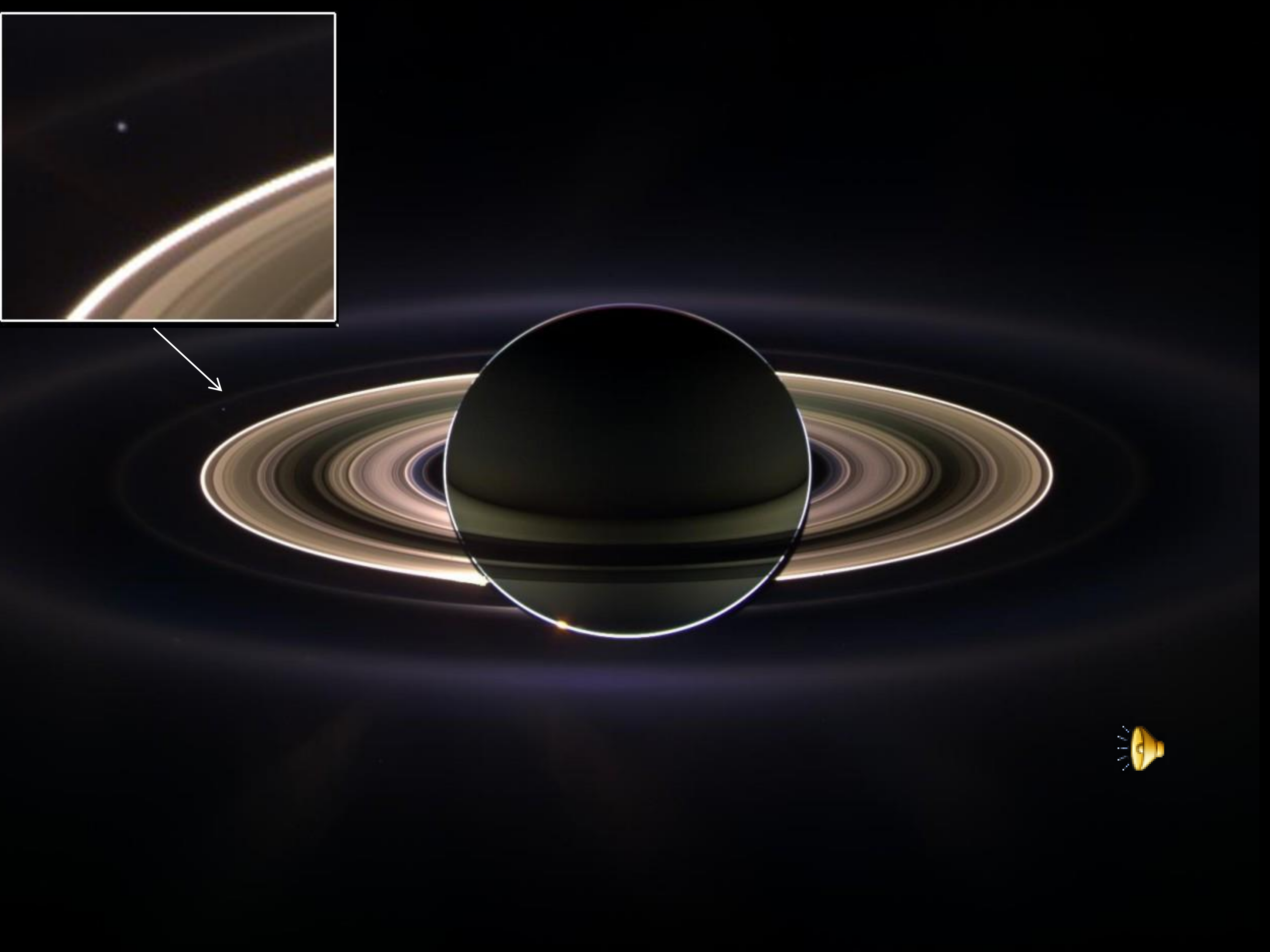
Supernova in Our Neighborhood

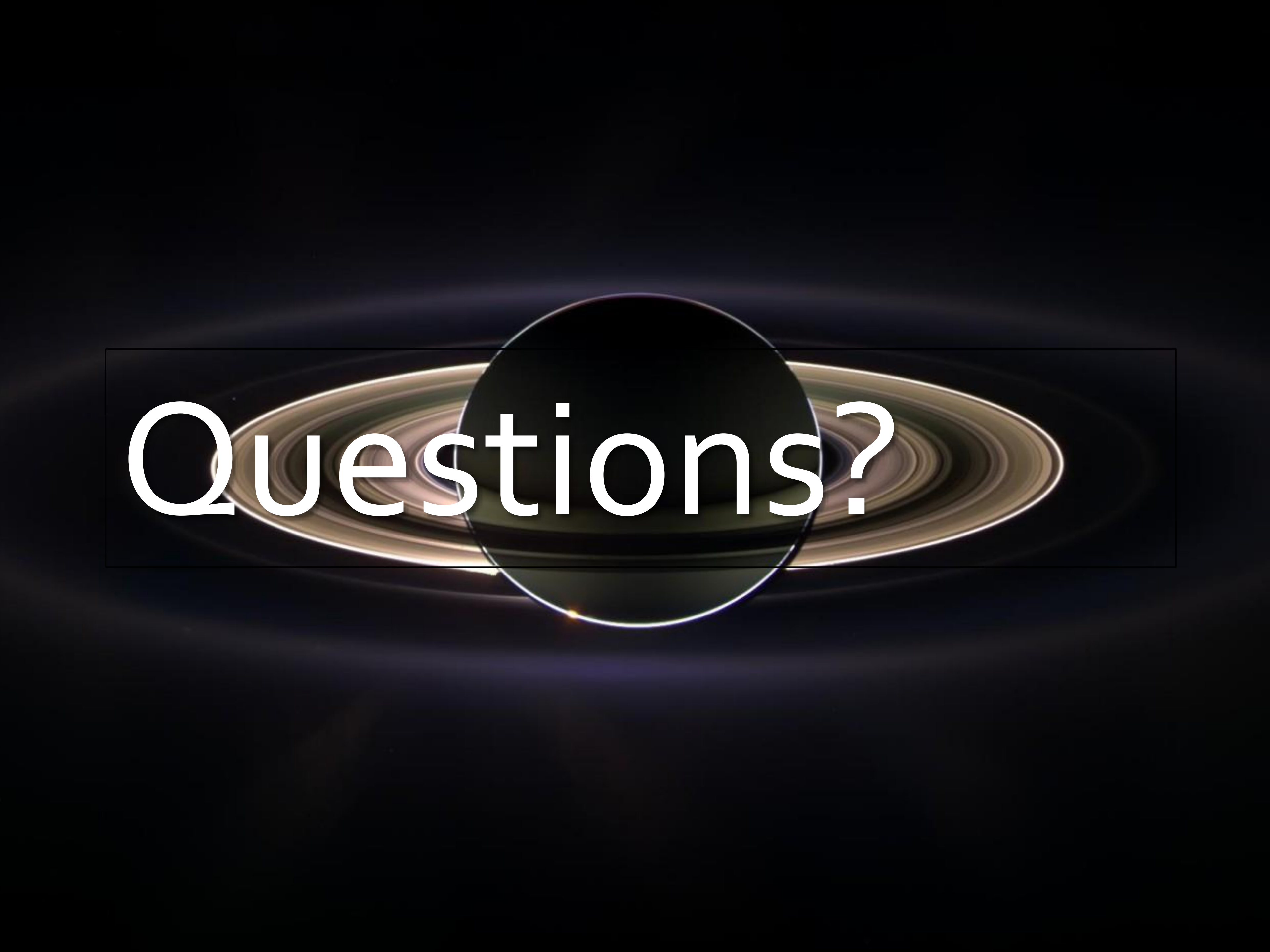
Which stars?

Orion's stars likely to go supernova!

Designating Stars

- About 600 have names
- Cataloged by Brightness and Constellation
- A large number pf star catalogs exist.





Questions?