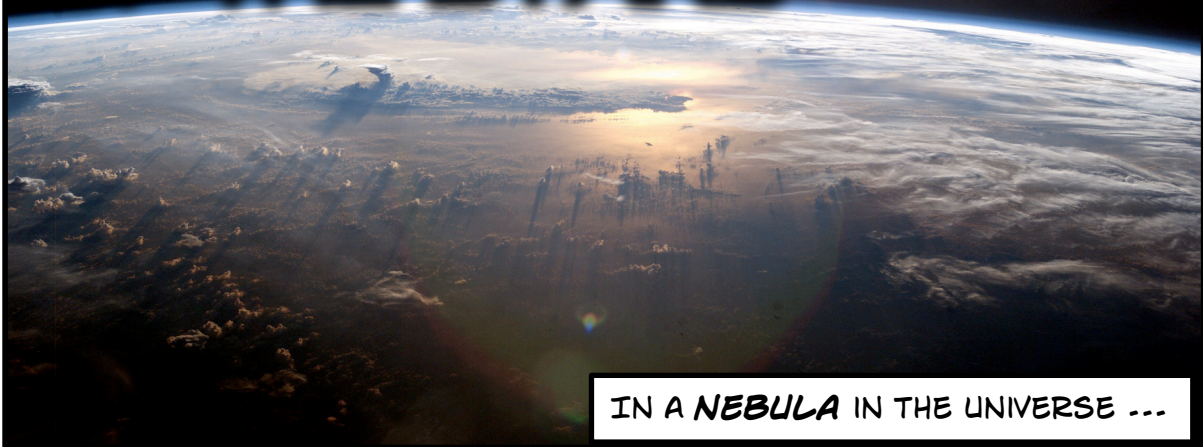


THE ONTOGENESIS OF THE STARS



IN A **NEBULA** IN THE UNIVERSE ...

THERE WAS A
COLLAPSE OF GAS AND
DUST



AND A
PROTOSTAR
WAS BORN



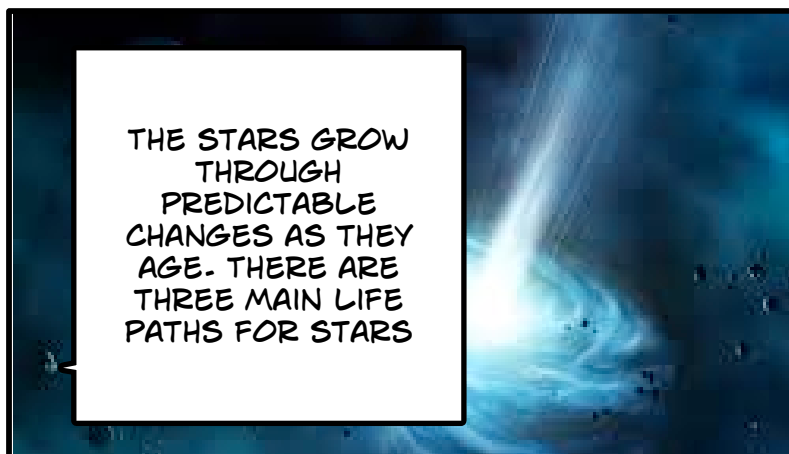
BUT DUE TO THE LACK
OF SIZE IT
DISSAPPEARED

IF THERE IS
ENOUGH GAS
AND DUST
COLLECTED
THE CORE
WILL
EVENTUALLY
REACH 10
MILLION
DEGREES
CELCIUS

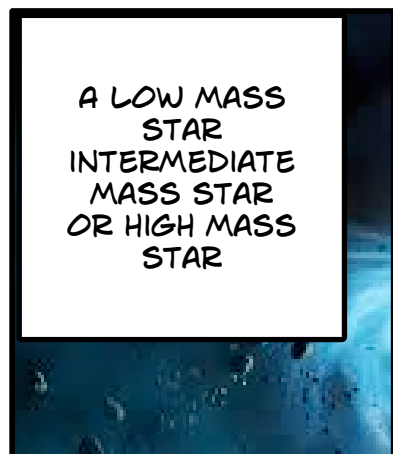


AT THAT POINT THE
ATOMS FORM
TOGETHER TO
FORM LARGER
SINGLE ATOMS,
HYDROGEN ATOMS
COMBINE TO FORM
THE HEAVIER
ELEMENT HELIUM
THIS PROCESS IS
CALLED NUCLEAR
FUSION

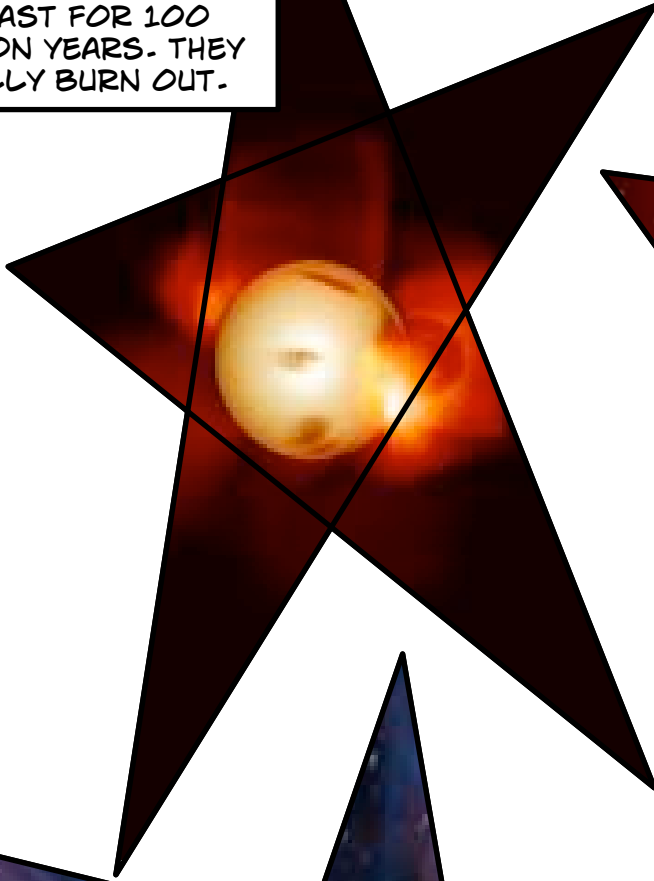
THE STARS GROW
THROUGH
PREDICTABLE
CHANGES AS THEY
AGE. THERE ARE
THREE MAIN LIFE
PATHS FOR STARS



A LOW MASS
STAR
INTERMEDIATE
MASS STAR
OR HIGH MASS
STAR



LOW MASS STARS:
STARTS SMALL, AND
EXISTS AS DIM, COOL
RED DWARFS.
CAN LAST FOR 100
BILLION YEARS. THEY
USUALLY BURN OUT.



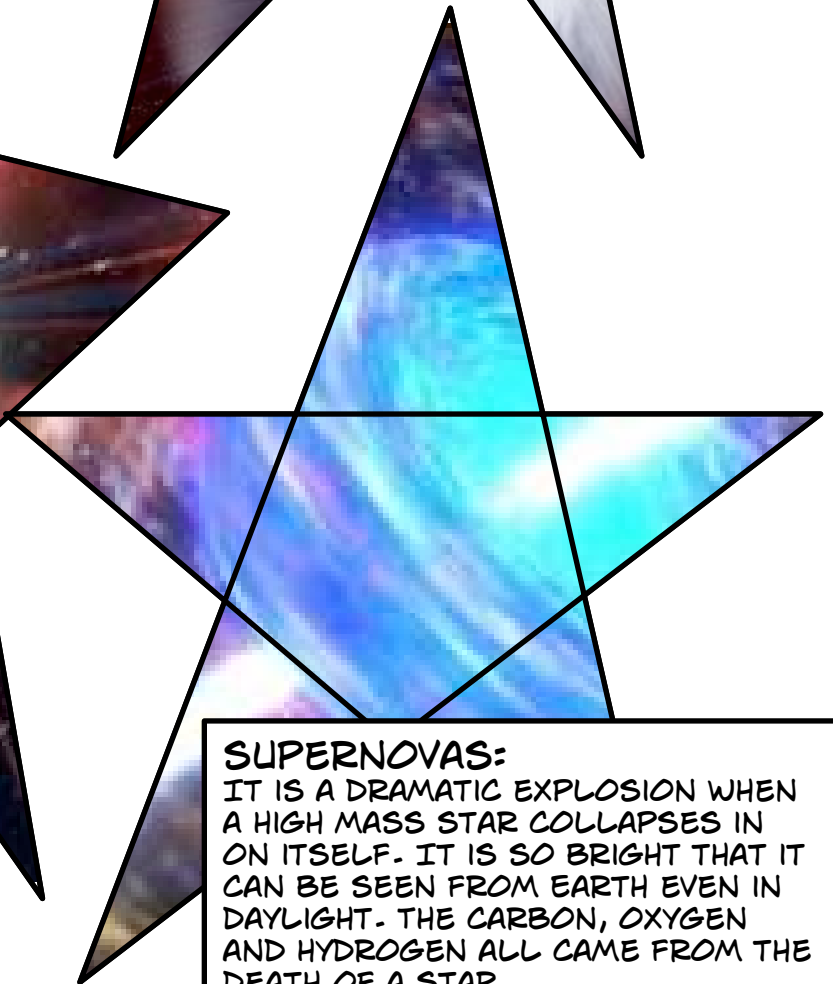
**INTERMEDIATE
MASS STARS:**
ONLY LASTS ABOUT
10 BILLION YEARS.
AFTER LONG PERIOD
OF TIME, IT EXPANDS
INTO A RED GIANT.
THEY SHRINK INTO A
WHITE DWARF, AND
EVENTUALLY A
BLACK DWARF.



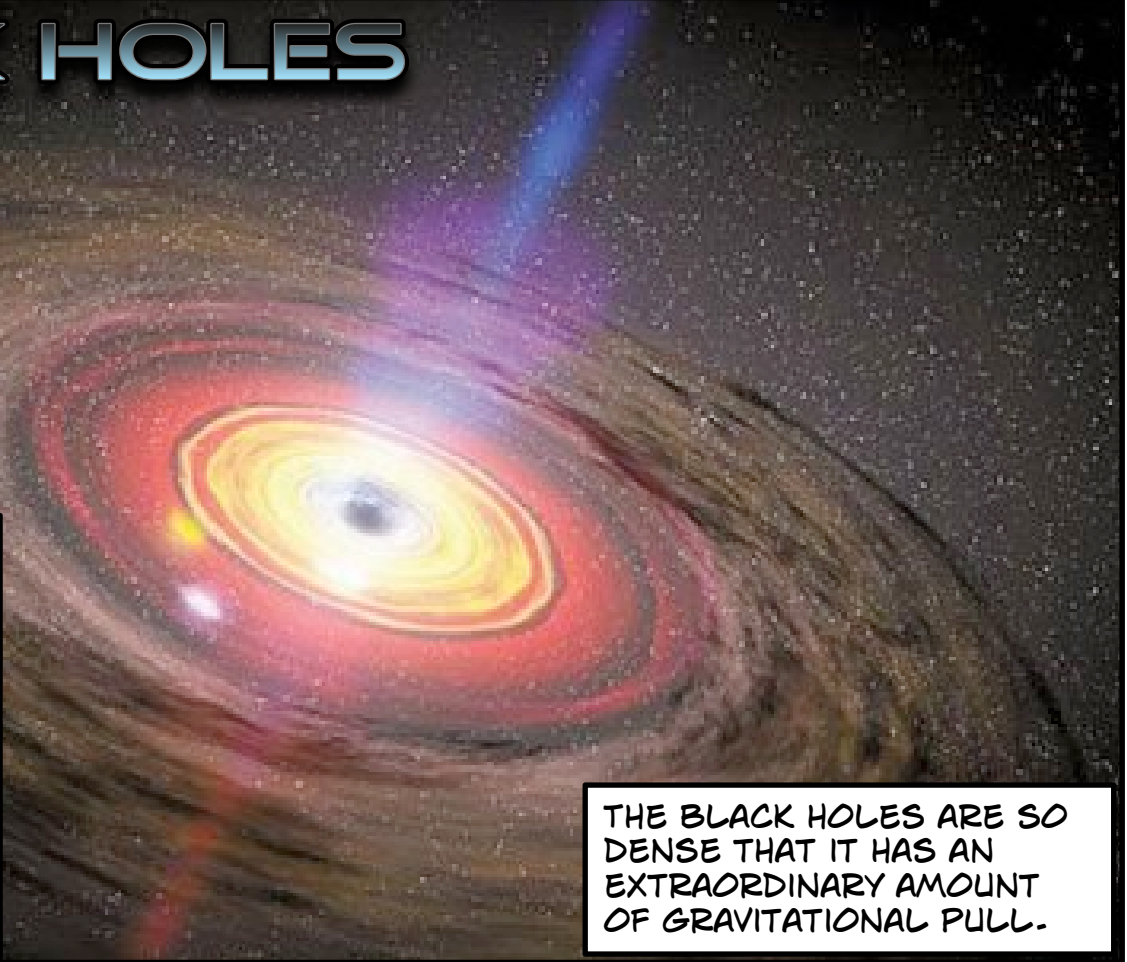
**HIGH MASS
STARS:**
THEY MUST BE 12
OR MORE TIMES
THE MASS OF AN
INTERMEDIATE
STAR. ONLY LASTS
FOR ABOUT 7
BILLION YEARS.
VIOLENTLY ENDS
INTO A SUPERNOVA
OR BLACK HOLE.



SUPERNOVAS:
IT IS A DRAMATIC EXPLOSION WHEN
A HIGH MASS STAR COLLAPSES IN
ON ITSELF. IT IS SO BRIGHT THAT IT
CAN BE SEEN FROM EARTH EVEN IN
DAYLIGHT. THE CARBON, OXYGEN
AND HYDROGEN ALL CAME FROM THE
DEATH OF A STAR.

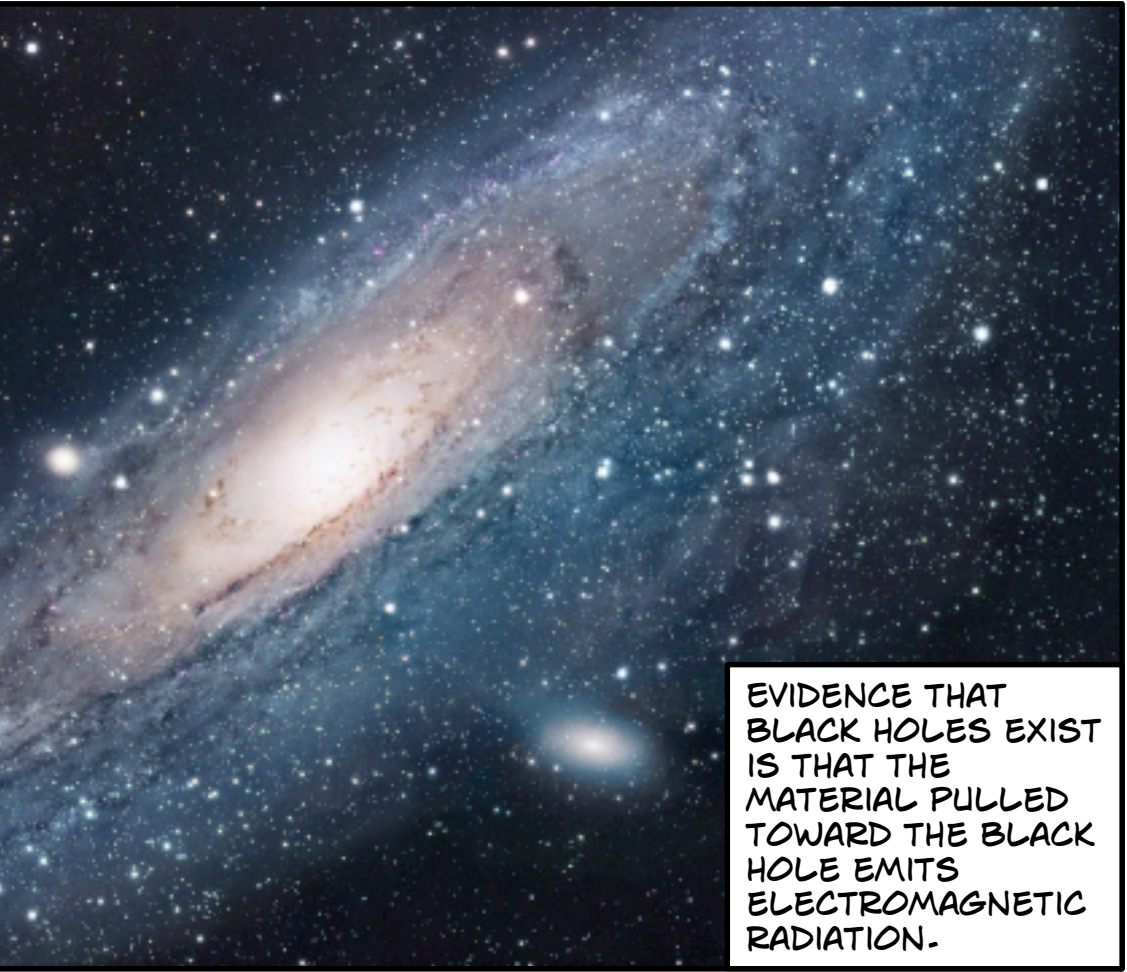


BLACK HOLES



A STAR MORE THEN 25 TIMES AS MASSIVE AS THE SUN FACES A DIFFERENT END AS A BLACK HOLE. AFTER EXPLODING AS A SUPANOVA IT BECOMES A BLACK HOLE AFTER COLLAPSING IN ONTO ITSELF.

THE BLACK HOLES ARE SO DENSE THAT IT HAS AN EXTRAORDINARY AMOUNT OF GRAVITATIONAL PULL.



BLACK HOLES ARE CALLED BLACK BECAUSE NOTHING NOT EVEN LIGHT CAN ESCAPE THEIR POWERFUL GRAVITATIONAL FORCE.

EVIDENCE THAT BLACK HOLES EXIST IS THAT THE MATERIAL PULLED TOWARD THE BLACK HOLE EMITS ELECTROMAGNETIC RADIATION.

BLACK DWARF: A BLACK DWARF IS A HYPOTHETICAL STELLAR REMNANT, CREATED WHEN A WHITE DWARF BECOMES SUFFICIENTLY COOL TO NO LONGER EMIT SIGNIFICANT HEAT OR LIGHT.

BLACK HOLE: A REGION OF SPACE HAVING A GRAVITATIONAL FIELD SO INTENSE THAT NO MATTER OR RADIATION CAN ESCAPE.

ELEMENTS: PURE SUBSTANCE MADE FROM ONLY ONE KIND OF ATOM. CANNOT BE BROKEN DOWN OR MADE SIMPLE.

FUSION : THE PROCESS IN WHICH THE NUCLEI OF ATOMS FUSE TOGETHER TO FORM LARGER SINGLE ATOMS CREATING AN ENORMOUS AMOUNT OF ENERGY.

NEBULA: A CLOUD OF GAS AND DUST IN OUTER SPACE, VISIBLE IN THE NIGHT SKY EITHER AS AN INDISTINCT BRIGHT PATCH OR AS A DARK SILHOUETTE AGAINST OTHER LUMINOUS MATTER.

PROTOSTAR: A CONTRACTING MASS OF GAS THAT REPRESENTS AN EARLY STAGE IN THE FORMATION OF A STAR, BEFORE NUCLEOSYNTHESIS HAS BEGUN.

NEBULA : A CLOUD OF GAS AND DUST IN OUTER SPACE, VISIBLE IN THE NIGHT SKY EITHER AS AN INDISTINCT BRIGHT PATCH OR AS A DARK SILHOUETTE AGAINST OTHER LUMINOUS MATTER.

RED DWARF: A SMALL, OLD, RELATIVELY COOL STAR.

RED GIANT: A COOL, RED STAR.

WHITE DWARF: A SMALL VERY DENSE STAR THAT IS TYPICALLY THE SIZE OF A PLANET.

WHITE GIANT: A GIANT STAR IS A STAR WITH SUBSTANTIALLY LARGER RADIUS AND LUMINOSITY THAN A MAIN SEQUENCE STAR OF THE SAME SURFACE TEMPERATURE.