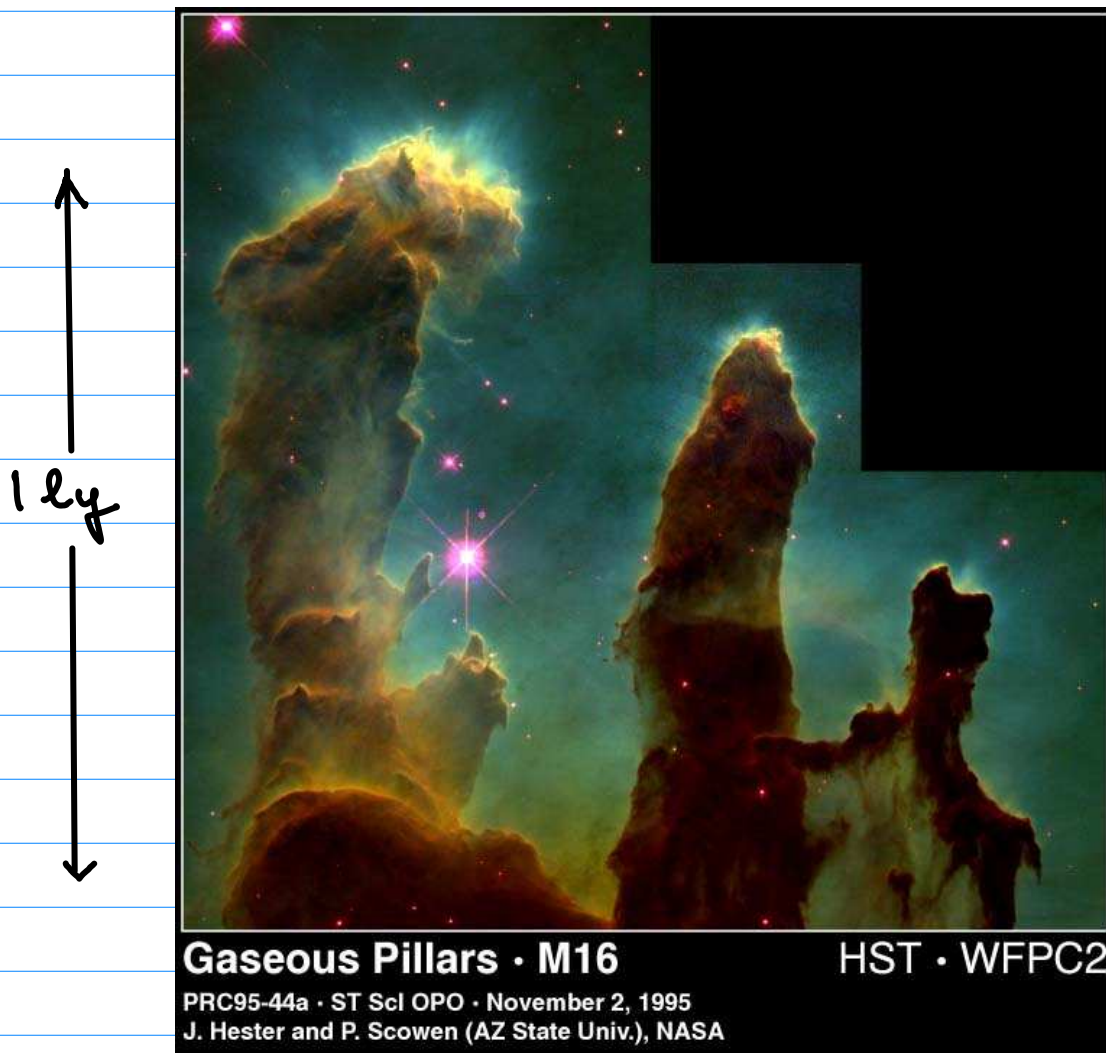


STARS ARE FORMED IN THE GIANT
MOLECULAR CLOUDS (GMC):

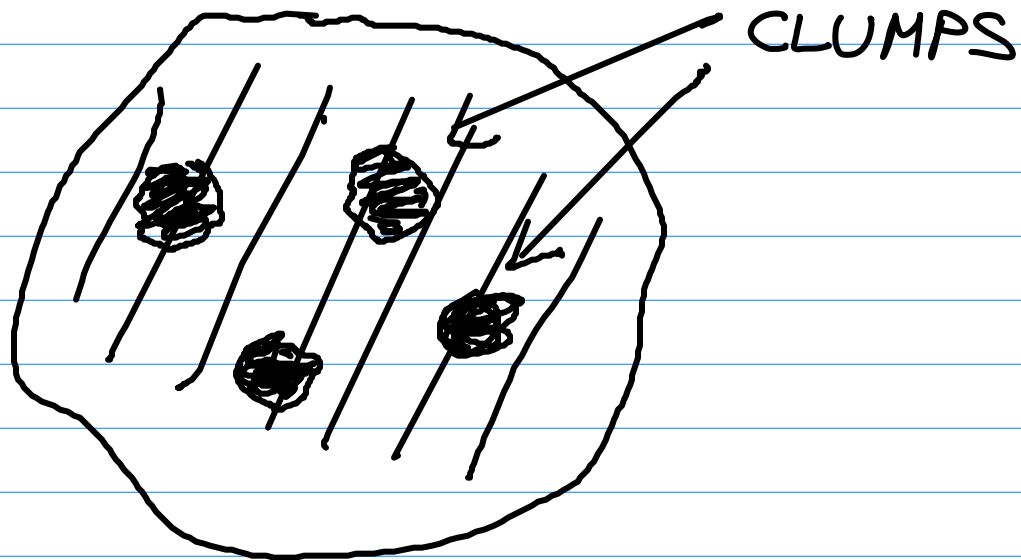


GIANT : THE DIAMETER RANGES FROM 15 ly
TO 600 ly

MOLECULAR : THEY ARE DENSE ; THE DUST
BLOCKS THE STARLIGHT OF THE
SURROUNDING STARS KEEPING THE
INTERIOR OF THE CLOUD COOL ;

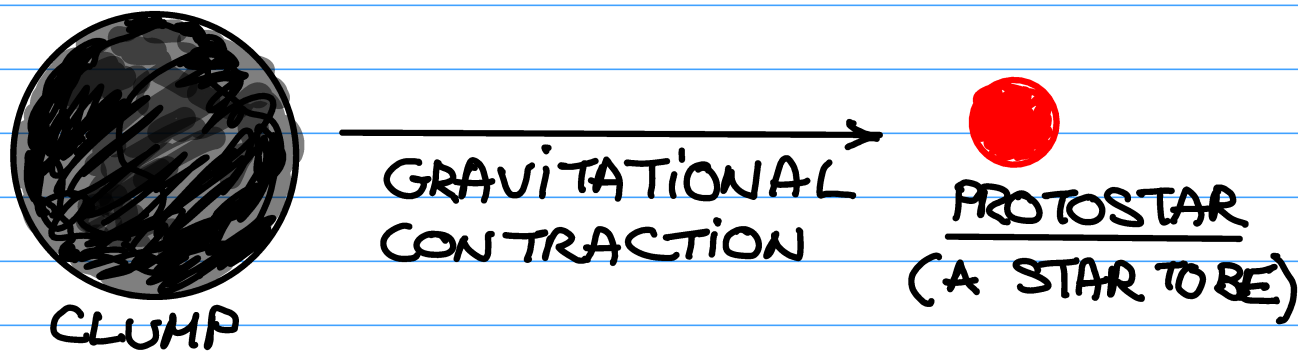
THE LOW TEMPERATURE MAKES IT POSSIBLE FOR THE HYDROGEN ATOMS TO BIND INTO MOLECULES H_2 .

THE MATERIAL IN GMC IS NOT DISTRIBUTED UNIFORMLY - THERE ARE CLUMPS OF HIGHER DENSITY



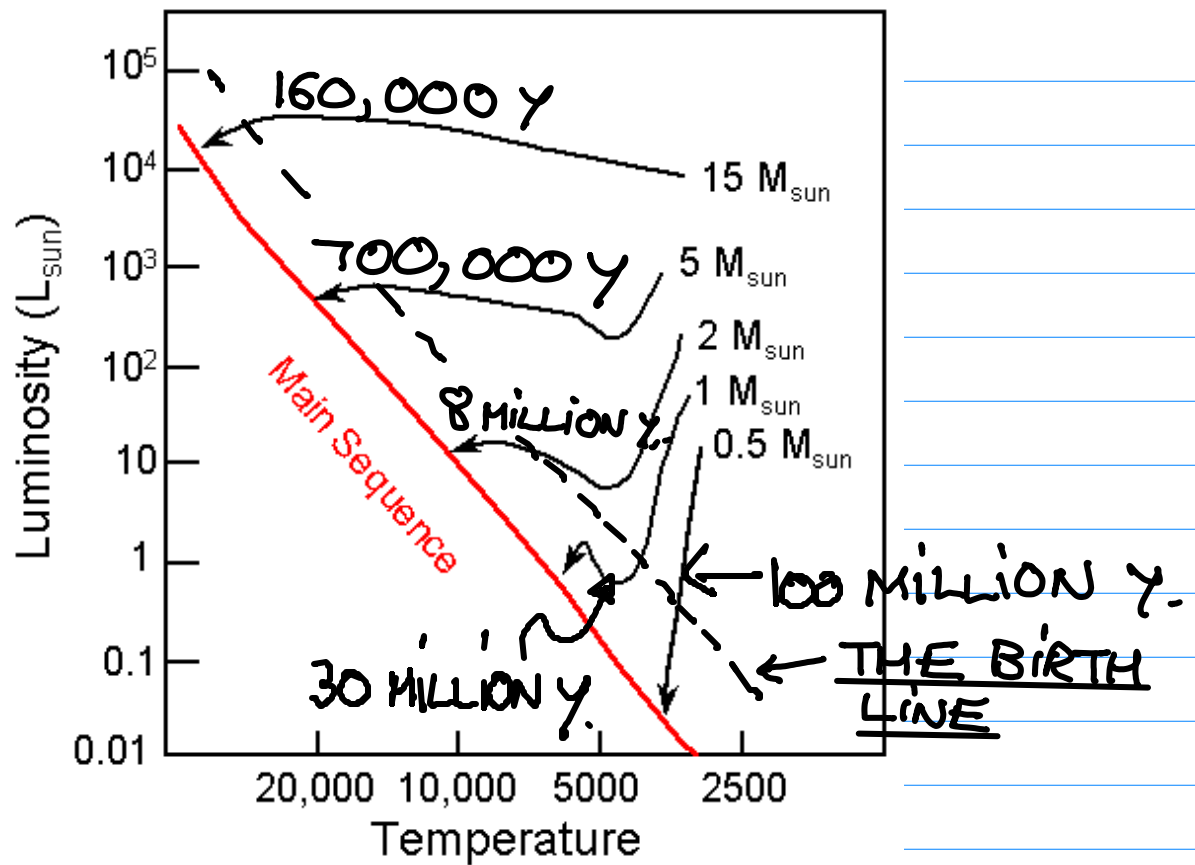
WHY DO THESE CLUMPS FORM? LIKELY AN EXPLOSION FROM A NEARBY SUPERNOVA CREATES A SHOCK WAVE WHICH PRODUCES CLUMPS AS IT PASSES THROUGH THE GMC (SEE THE LINK "TRIGGERED STAR FORMATION" UNDER THE STUDY AIDS)

SOME DENSE CLUMPS START COLLAPSING UNDER THEIR OWN GRAVITY AND THEY HEAT UP IN THE PROCESS (GRAVITATIONAL ENERGY IS CONVERTED INTO THERMAL ENERGY):



IF THE CLUMP HAS ENOUGH MASS SO THAT THE TEMPERATURE IN THE CORE OF THE PROTOSTAR REACHES AT LEAST 10 MILLION DEGREES K, THE FUSION OF HYDROGEN (H) INTO HELIUM (4He) WILL START AND THE PROTOSTAR BECOMES A MAIN SEQUENCE STAR.

THIS PROTOSTAR STAGE IS SHORTER FOR HIGHER MASS STARS AND LONGER FOR THE LOWER MASS STARS:



THE PROTOSTARS CAN BE OBSERVED AT INFRARED WAVELENGTHS WHEN THEIR EVOLUTIONARY TRACK ON H-R DIAGRAM CROSSES THE BIRTH LINE.