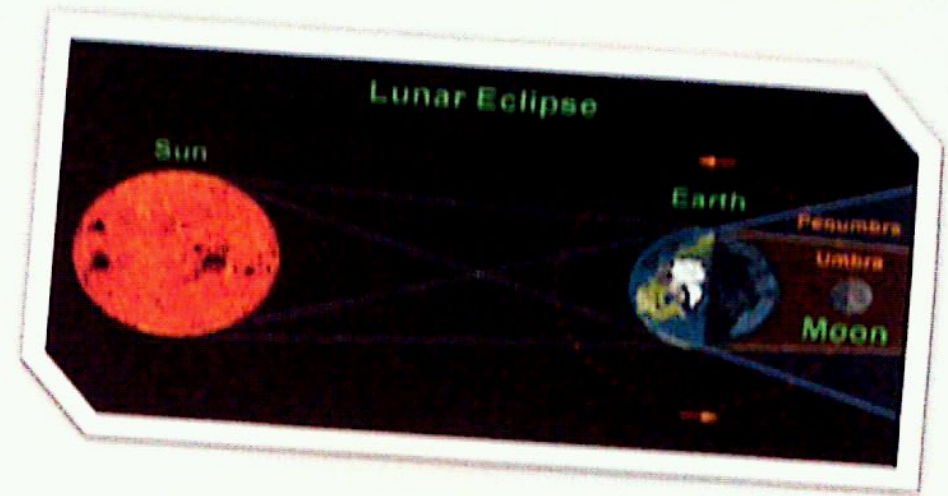


# Eclipses Handout



## Vocabulary-

**Umbra:** darkest layer of the shadow casted

**Penumbra:** lighter layer of the shadow casted

**Solar eclipse:** occurs when the moon moves directly between the Sun and Earth and casts its shadow over part of Earth.

**Lunar eclipse:** occurs when Earth's shadow falls on the Moon.

**Partial lunar eclipse:** when only part of the moon moves into Earth's umbra.

**Penumbral lunar eclipse:** when the Moon is totally in Earth's penumbra.

**Partial solar eclipse:** experienced by person standing in the penumbra.

## Fusion Handout

Kelly, Michelle

### (1) Steps of Fusion:

- I. Two hydrogen protons (hydrogen nuclei) collide
- II. One proton decays into neutron, subatomic particles are released
- III. Another proton collides with the proton and neutron, forms a helium isotope
- IV. 2 Helium isotopes collide with enough energy to fuse
- V. Helium nucleus is formed when two protons break away and more energy is released

### (2) Key Concepts

- I.  $E = mc^2$  Leftover mass is transformed into energy. (Starts with 6 proton/neutron in total, ends with 2 proton + 2 neutrons (4 total))
- II. Hydrogen fused into Helium
- III. Isotope- Different amount of proton and neutrons
- IV. Proton- Positively charged
- V. Neutron- No charge

David Gu, Jonathan Ou

## *Evolution of Stars*

### **High Mass Star**

- A. Nebula breaks into smaller pieces from instability caused by gravity.
- B. Larger stars fusion causes higher temperatures and expansion. It turns into a super giant.
- C. The out portion of a star explodes, forming an incredibly bright supernova.
- D. When a supernova is 1.3 times larger than the sun, it shrinks will form a neutron star.
- E. A large supernova core collapses to a point, forming a black hole.

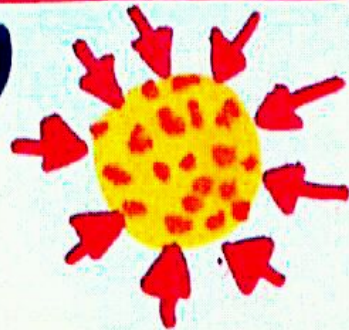
### **Low Mass Star**

- A1. Temperature in each nebula piece increases, as the energy radiates into space, stars are born.
- B1. When hydrogen is depleted, the balance no longer exists. The outer layer expands and cools. Then a giant is made.
- C1. When a core contracts into small star, the outer layer escapes. A white dwarf is formed from a giant star.

# The Big Bang Theory

- Pressure
- Hot
- Dense
- Explosion
- Expanding
- Singularity
- red shift

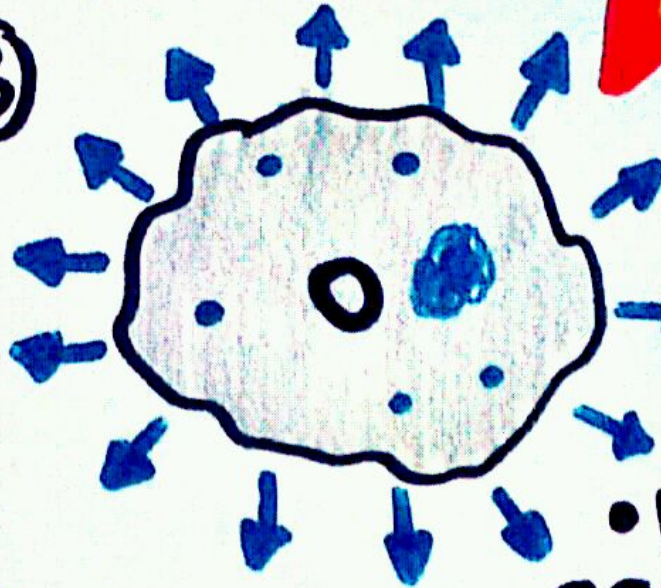
①



②



③



④



• 13.8 billion years ago  
• after 1 million years, stars formed



Yi fan Shen  
Hedy Wang

### The Impact Theory

- 1) A Mars-sized object collided with Earth
- 2) The blast ejected material from both objects into space
- 3) A ring of gas and debris formed around earth
- 4) Particles in the ring joined together to form the moon.

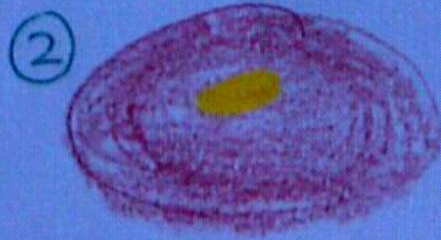
### The Moon's Surface

- Many craters (caused by meteorites, asteroids, and comets striking the surface)
- Maria – flat dry areas formed by ancient lava flows.
- The igneous rocks of the maria are the youngest rocks to be found on the moon.
- This indicates that craters formed after the moon's surface originally cooled.
- The maria formed early enough in the moon's history that molten material still remained in the moon's interior

### The Moon's Interior

- Mantle : Upper – solid  
Lower – partly molten
- Core: iron-rich, solid

# FORMATION OF THE SOLAR SYSTEM



① Solar system was ice, dust, and gas.

② It contracted into a spinning disk. The center was very hot, so nuclear fusion began. The sun was born.

③ Rest of disk cooled down and clumped.

④ Clumps collided to form planets.

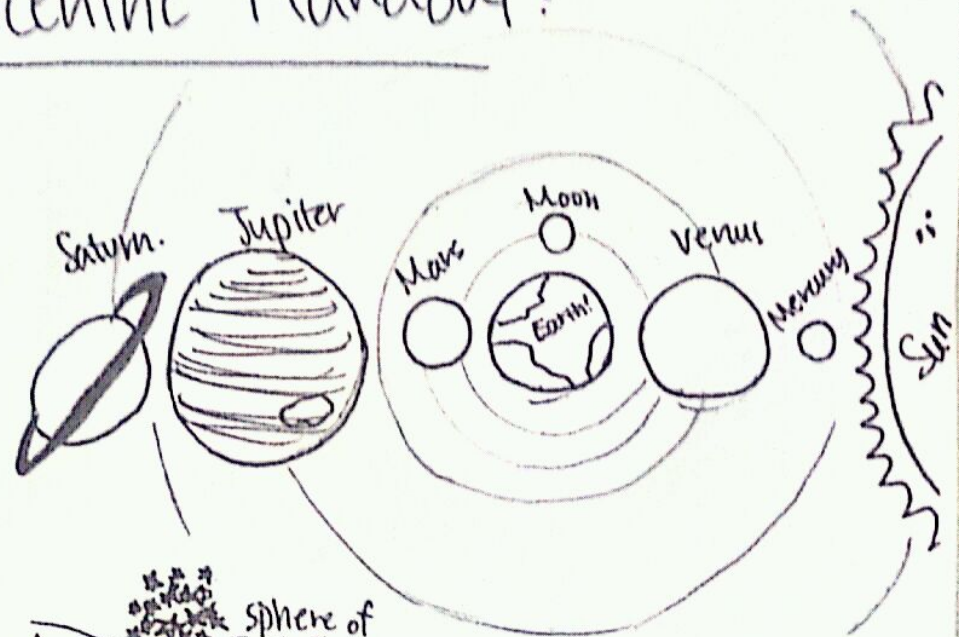
Emily W., Marisa V., Sally P. SB.

## Heliocentric & Geocentric Handout:

### Geocentric Model: (EARTH-CENTERED)

- Sun
  - Moon
  - Mercury, Venus, Mars, Jupiter, Saturn.
  - Sphere of Stars.
- this idea lasted centuries.

} rotates around Earth



### Heliocentric Model: (SUN-CENTERED)

(1543) Copernicus stated:

- Moon revolved around Earth.
- Earth & other planets revolved around Sun.
- Movements of planets & Stars are caused by Earth's rotation.

Galilei observed / concluded:

- Venus's phases
- Venus's diameter (smallest when phase was near full)

