



Chapter 30, Section 1

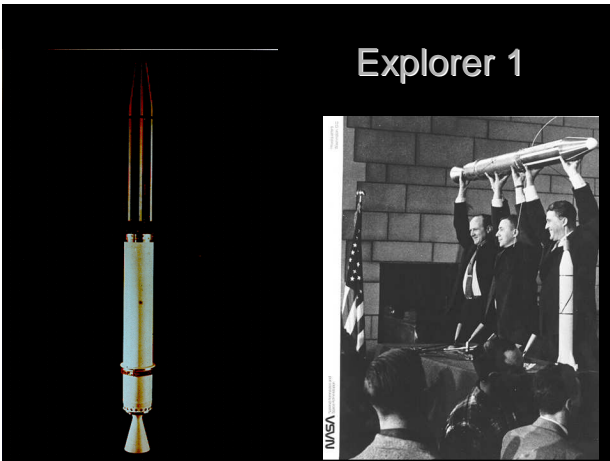
30.1 The Earth's Moon

Introduction

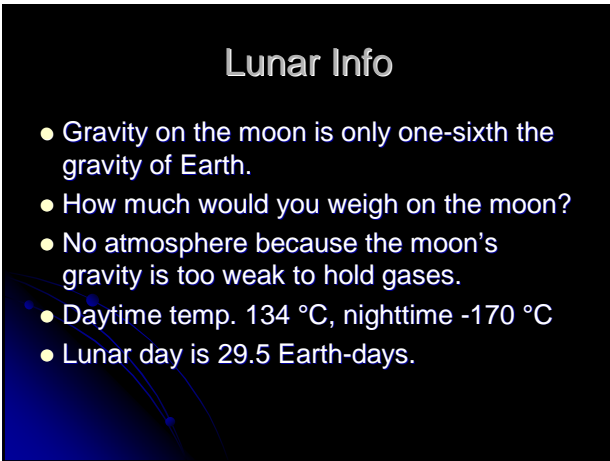
- **Satellite:** any body that orbits a larger body
- 1957: Soviet Union launched *Sputnik 1*, the Earth's first artificial satellite.
- 1958: U.S. launched *Explorer 1*.
- A **natural satellite** of any planet is called a moon



Sputnik 1

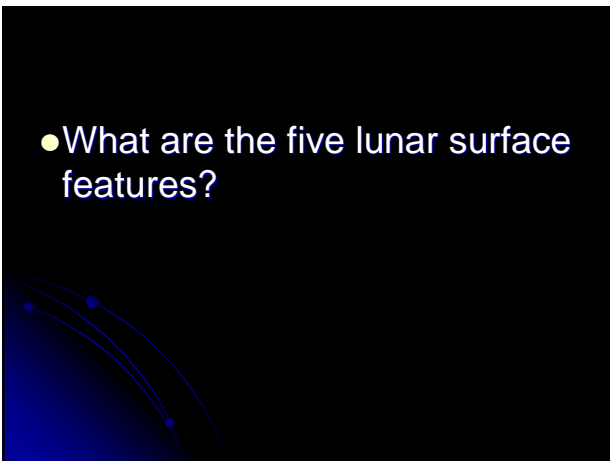


Explorer 1



Lunar Info

- Gravity on the moon is only one-sixth the gravity of Earth.
- How much would you weigh on the moon?
- No atmosphere because the moon's gravity is too weak to hold gases.
- Daytime temp. 134 °C, nighttime -170 °C
- Lunar day is 29.5 Earth-days.



- What are the five lunar surface features?

5 lunar features

1. maria
2. rilles
3. craters
4. rays
5. highlands
 - anorthosites
 - breccia
 - regolith

The Lunar Surface

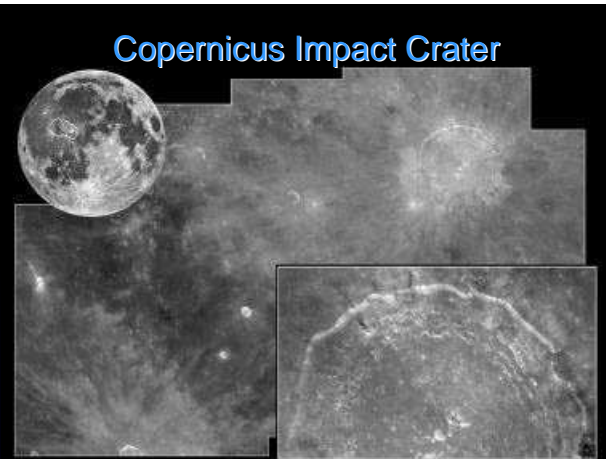
- Light and dark patches on the moon.
- Light areas are rough highlands made of light-colored rock.
- Dark areas, called **maria** (MAHR-ee-uh)
- The maria are plains of solidified lava.
- **Rilles** are long, deep channels that run through the maria.
- Rilles were probably lava channels when the moon was volcanically active.



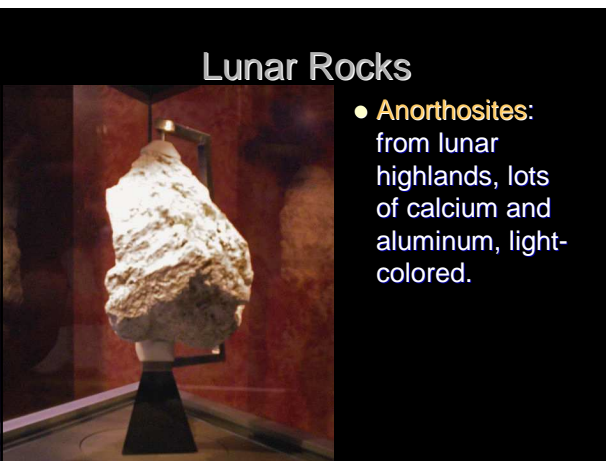
Craters

- The Moon's surface is covered with bowl-shaped depressions called **craters**
- Most were formed 4 billion years ago
- Debris that was thrown away from the impact sites formed **rays** that extend in all directions from the crater

Copernicus Impact Crater



Lunar Rocks



- **Anorthosites:** from lunar highlands, lots of calcium and aluminum, light-colored.

Regolith

- **Regolith:** dust and small fragments that cover the lunar surface.
- Depth of regolith varies from 1m to 6m



Breccia

- Breccia: found in both maria and highlands
- They are fragments of other rocks that have melted together.



- What is the interior of the Moon like?

Interior of the Moon

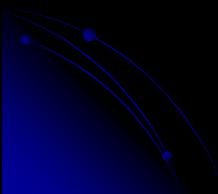


- Seismographs were placed on the moon by Apollo astronauts between 1969-1972

Interior...see page 620

- Recorded numerous weak quakes
- Crust facing Earth is 60km thick
- Crust facing away from Earth is up to 100km thick.
- Beneath crust is the mantle
- Mantle depth = 1000km
- Core: possibly molten, possibly iron, less than 700km
- Almost no magnetic field, but local areas of magnetism exist, suggesting a solid core.

Q: What are the 4 stages in the development of the Moon?



Stage 1

- **Giant-impact hypothesis:** suggests the Moon formed when a Mars-sized body struck the Earth early in the history of the solar system.
- The collision caused fragments to be ejected up into space.
- These fragments eventually joined together to form the Moon.

2nd stage

- Moon was covered by an ocean of hot, molten rock.
- As the Moon cooled, materials separated by density.
- Heavier elements sank to the **core**.
- Lighter elements formed the **mantle**.

3rd stage

- Outer surface of the Moon cooled and formed a thick crust over the molten rock
- Debris left over from the formation of the solar system struck the Moon, giving the Moon its craters.
- Some impacts broke through the crust.
- Lava flowed through these breaks to the surface and formed the smooth **maria**.

4th stage

- 3 bya until now
- Impacts decreased to almost nothing
- Geologic activity stopped because of cooling.
