Lunar Geology of the Apollo Seventeen Landing Site

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Lunar Maria

- The Lunar Maria are smooth level areas that were once deep basins. Today maria cover about 16% of the lunar surface area.
- At one point basins like Serenitatis were filled in basaltic lava flows, and this is what gives maria their distinctive low albedo.
- Since they’re formed by volcanic activity, outlying flows, ash beds or any combination of these can be found in or around the mare.
Mare Serenitatis

- Mare Serenitatis or the Sea of Serenity is 707km total in size.
- And eventually connects with Mare Tranquillitatis to the south.
- The mare material was made during the Upper Imbrian epoch, and its basin was most likely caused by a massive impactor.
Lunar Plains

- Plains are flat and low.
- Intermediate albedo.
- Underlying features are completely covered and there is no visible evidence of volcanism.
Lunar Plains Con’t

• Similar to Mare materials but degraded and with a higher albedo.

• This possibly indicates that they are older lava flows.

• The lighter blue areas indicate undisturbed plains.

• While the Darker Blue area indicate plains that have been disturbed by the crater Chacornac.
Local Terra Types

• **Dome Terra** - A volcanic dome whose texture should reflect its composition.

• **Regular Terra** - Smooth rolling hills that inter-mingle with plains materials.

• **Rugged Terra** - Ranges from large mountains to rough hills, and are made of brecciated ejecta blankets of differing ages.

• **Hilly Terra** - Round smooth hills and hummocks, found mostly around basins and are usually closely clustered and has a similar make up and similarly built up over time.
Craters

- **Simple:**
  - Over time the ejecta and rays will become less discernable from and slowly merge with the surrounding mare. Also, its raised rim will become smoother.

- **Complex:**
  - These differ from simple craters in that they have a central peak. Therefore the aging/erosion process are very similar, again differing only in the peak, that will also erode and become difficult to identify.

- **Primary:**
  - The primary crater is the parent crater, directly formed by an impact with a celestial object.

- **Secondary, tertiary, etc:**
  - Are formed by objects that were thrown back up and out of the crater by the force of the original impact and aloud to form another crater.
**Crater Examples**

The yellow box surrounds Le Monnier. This crater is now partially hidden by the intrusion of mare material caused by a volcanic eruption that filled the basin as well. (Diameter=61km)

The red box surrounds Romer M, a secondary crater of Romer. Also, this is an example of superposition in which an impact interrupts the rim of a crater. (Diameter=10km)

The blue box surrounds the outer rim of the ejecta of Chacornac. This shows a relatively new impact. (Diameter = 51km)

Lastly the **Purple Circle** highlights a small crater chain. Crater chains are formed when an impactor breaks up before the actual impact.
Lunar Features

- **Grabens** – formed by two parallel normal faults that allow the center area to drop down forming a valley.
- **Scarp** – A type of fault. It is the displacement of land alongside a fault.
- **Mare Ridge** – The raised edges of a mare impact basin.
- **Trough** – A depression that is characterized by its shallow ridges.
- **Lineament** – A linear expression used to characterize a fault lined valley.
- **Depression** – A decrease in elevation from the surroundings.
- **Dark Crater Area** – Areas with dark haloed craters.
- **Fault** – A fracture in the surface.


