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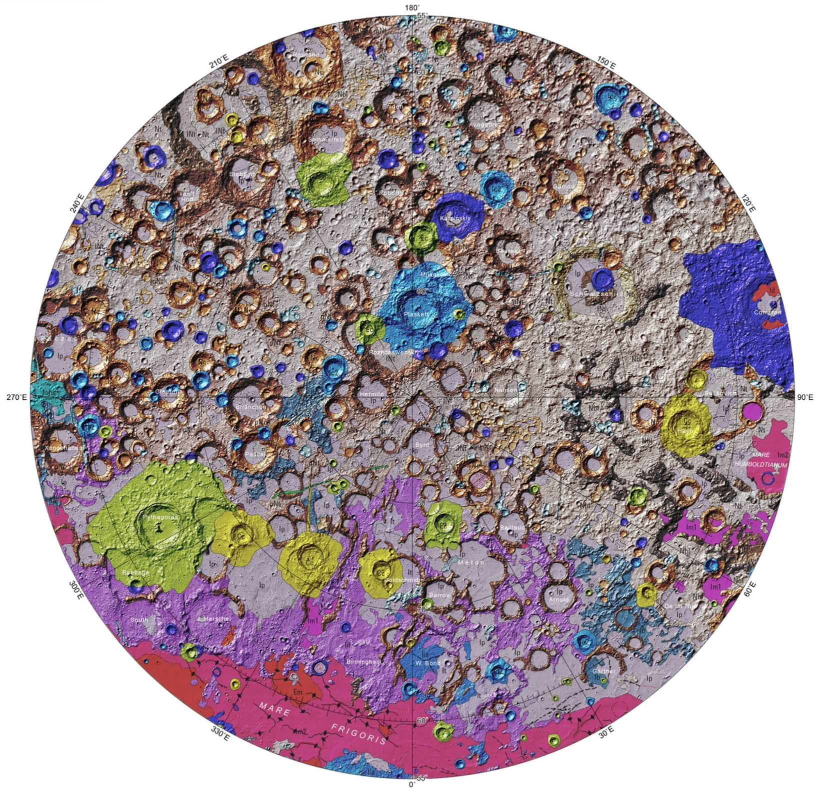
Brief Description of Map Units and Explanation of Map Symbols

- **Cc / Ccc** — **Copernican Crater** - Rim, wall and floor deposits of craters with sharp prominent rims, circular to polygonal outlines. High relative brightness and rays. **Crater, Catena** - Elongated linear clusters of overlapping circular to semi-circular.
- **Csc** — **Copernican Crater, Secondary** - Small to very small diameter craters, densely spaced near and/or on the ejecta blanket of craters. *Interpretation:* Impact crater forms derived from blocky material ejected from the primary impact.
- **Ec** — **Eratosthenian Crater** - Non-rayed, circular craters with sharp to partially subdued crater rim crests, partial circumferential ejecta present, and lower albedo compared to unit Cc. *Interpretation:* Morphology and material from a primary impact event.
- **Ecc** — **Eratosthenian Crater, Catena** - Elongated linear to elliptical clusters of circular to semi-circular depressions, often overlapping. *Interpretation:* Impact crater clusters derived ejecta from large, basin forming impacts. Possibly primary impacts.
- **Esc** — **Eratosthenian Secondary Crater** - Small to very small diameter craters, densely spaced near and/or on the ejecta blanket of craters. *Interpretation:* Impact crater forms derived from blocky material ejected from the primary impact.
- **Em** — **Eratosthenian Mare** - Low relative brightness plains with relatively few craters large enough to map, patches of small domes, sharp-crested ridges, observable flow fronts. *Interpretation:* Relatively thin, young volcanic flows or pyroclastic material.
- **Elp** — **Eratosthenian Imbrian Plateau** - Forms high standing plateaus (relative to the mare surfaces in Oceanus Procellarum) with domes, cones, and dark mantling materials. *Interpretation:* Volcanic constructs, flows, and pyroclastic materials.
- **Ic** — **Imbrian Crater, Undivided** - Subdued topographic relief compared to younger impact features, generally less than 40 km in diameter, with broad flat floors, and little to no ejecta present. *Interpretation:* Subdued morphology and material from a primary impact event.
- **Ic1** — **Imbrian Crater, Lower** - Similar description to unit Ic, craters mantled by materials of the Orientale group. *Interpretation:* Subdued morphology and material from a primary impact event, younger than Imbrium group materials but older than Orientale group materials.
- **Ic2** — **Imbrian Crater, Upper** - Similar description to unit Ic, craters superpose materials of the Orientale group. *Interpretation:* Subdued morphology and material from a primary impact event, younger than Orientale group materials but older than unit Im2.
- **Icc** — **Imbrian Crater, Catena** - Subdued and mantled elongated linear to elliptical clusters of circular to semi-circular depressions, often overlapping. *Interpretation:* Impact crater clusters derived ejecta from large, basin forming impacts. Possibly primary impacts.
- **Isc** — **Imbrian Crater, Secondary** - Small diameter craters, densely spaced near and/or on the ejecta blanket of craters. *Interpretation:* Impact crater forms derived from blocky material ejected from the primary impact.
- **Icf** — **Imbrian Crater, Fracture Floor** - Crater floors typically domed, with furrows and/or linear to curvilinear fractures with variable widths and depths. Blocks and material between the fractures sometimes reoriented. *Interpretation:* Brittle materials uplifted and extended.
- **Ib** — **Imbrian Basin, Undivided** - Gently rolling to hilly terrain containing aggregates of subdued irregular to circular craters. Also forms outer basin and ejecta of crater Schrodinger. *Interpretation:* Materials emplaced during the formation of multi-ringed impact basins.
- **Ibm** — **Imbrian Basin, Massif** - Rugged blocks forming arcuate raised ridges within crater Schrodinger. *Interpretation:* Material uplifted during basin formation, representing the inner ring of a multi-ringed impact basin.
- **Id** — **Imbrian Dark Mantle** - Some of the lowest albedo material mapped, generally occurs near the outer margins of larger basins. Scalloped, smooth textures with small craters. *Interpretation:* Pyroclastic material.
- **Ig** — **Imbrian Grooved** - Covers craters and other terrae of pre-Nectarian through Imbrian age. Craters have radial grooves on rims and walls with some mounds. *Interpretation:* Origin uncertain. Possibly Imbrium ejecta or result of seismic shaking.
- **Iia** — **Imbrian Imbrium Alpes Formation** - Angular blocky and knobby with smooth, mantled surface. Closely spaced hills and hummocks, ~2-5 km in diameter. *Interpretation:* Possibly eroded ejecta, structurally deformed bedrock, or both.
- **Iiap** — **Imbrian Imbrium Apenninus Formation** - Coarse blocks of material parallel to scarp bordering Imbrium basin. Smooth to undulating interblock materials. *Interpretation:* Intensely fractured bedrock with interstitial Imbrium ejecta.
- **Iic** — **Imbrian Imbrium Crater** - Individual craters <25 km diam., clusters and chains of craters <10 km diam. radial to Imbrium. Moderately subdued topographic features. *Interpretation:* Secondaries and crater chains emplaced during Imbrium basin formation.
- **Iif** — **Imbrian Imbrium Fra Mauro Formation** - Sinuous, curvilinear, and straight ridges draping the surface below. Surface texture locally hummocky. *Interpretation:* Ejecta from Imbrium basin and materials of the substrate.
- **Im1** — **Imbrian Mare, Lower** - Forms flat, smooth surfaces. Relatively higher albedo compared to unit Im2 but lower albedo than unit Ip. High density of superposed craters. *Interpretation:* Old basaltic lava, perhaps as old as Orientale basin.
- **Im2** — **Imbrian Mare, Upper** - Forms flat, smooth surfaces. Lower albedo and crater density than unit Im1. Numerous ridges. Difficult to distinguish from unit Id. *Interpretation:* Basaltic lava flows
- **Imd** — **Imbrian Mare, Dome** - Steeply sloping, high-relief, rough domical or conical shaped edifices, sometimes with pitted summits. *Interpretation:* Volcanic edifices or laccoliths
- **Iohi** — **Imbrian Orientale Hevelius Formation, Inner Facies** - Curvilinear to swirly ridges and troughs mostly radial and subradial to Orientale basin. *Interpretation:* Continuous ejecta blanket emplaced during outward flow of hot, turbulent, mobile materials.
- **Ioho** — **Imbrian Orientale Hevelius Formation, Outer Facies** - Swirly, lineated, hummocky and smooth materials forming a discontinuous and irregular boundary. *Interpretation:* Thinning distal margins of Orientale basin ejecta.
- **Ios** — **Imbrian Orientale Hevelius Formation, Secondary Crater Facies** - Overlapping crater chains and clusters radial and peripheral to the basin. *Interpretation:* Secondary impact craters formed by ejected blocks..
- **Iom** — **Imbrian Orientale Maunder Formation** - Smooth to rolling, intensely fractured plains with broad linear ridges and smooth domes. *Interpretation:* Mostly impact melt. Ridges and domes likely original floor material modified through compression.
- **Iork** — **Imbrian Orientale Montes Rook Formation, Knobby Facies** - Knobby, hummocky, rolling and chaotic materials with interstitial irregular grooves and depressions *Interpretation:* Uppermost part of overturned flap of the ejecta sequence of Orientale basin.
- **Iorm** — **Imbrian Orientale Montes Rook Formation, Massif Facies** - High-relief, smooth blocks marking the second and third rings of the basin. *Interpretation:* Structurally uplifted bedrock, thickly veneered with late arriving ejecta.
- **Ip** — **Imbrian Plains** - Smooth, flat to undulatory terrain of intermediate albedo occurring mostly in topographic lows and crater floors of Imbrian and older age. *Interpretation:* Ambiguous origin, likely Orientale and other large impact crater ejecta.
- **It** — **Imbrian Terra** - Low relief, low crater density, moderate to high albedo, moderately smooth surface. *Interpretation:* Complex mixture of local erosional debris and crater and basin ejecta; megaregolith.
- **Itd** — **Imbrian Terra, Dome** - Outlines and characteristics similar to main-sequence craters, with smooth inner flanks, paucity of ejecta, inner terracing, secondary cratering. *Interpretation:* Possibly target material differences, or ash-flow calderas.
- **INp** — **Imbrian Nectarian Plains** - Smooth, flat to undulating surface, moderate to high density of superposed craters. *Interpretation:* Possibly materials emplaced by the formation of Imbrian and Nectarian basins.
- **INt** — **Imbrian Nectarian Terra** - Gently rolling terrain, moderate to high density of craters *Interpretation:* Complex mixture of local erosional debris and crater and basin ejecta; megaregolith.
- **Nc** — **Nectarian Crater** - Considerably muted topographic relief compared to younger impact features, with broad flat floors typically another unit, and very little to no ejecta present. *Interpretation:* Muted morphology and material from a primary impact event.
- **Nb** — **Nectarian Basin, Undivided** - Material of raided walls and slumped blocks of basins, as well as aggregates of closely spaced subdued hills and ridges. *Interpretation:* Impact related structures and ejecta material.
- **Nbl** — **Nectarian Basin, Lineated** - Sharp, raised ridges, intervening flat areas or deep troughs and smooth hills with narrow grooves. *Interpretation:* Bedrock pervasively faulted by Imbrium impact.
- **Nbm** — **Nectarian Basin, Massif** - Rugged blocks most commonly 10 to 30 km across, forms highest and most rugged parts of arcuate raised ridges. *Interpretation:* Uplifted bedrock during the formation of Nectarian basins.
- **Nbsc** — **Nectarian Basin, Secondary Crater** - Grouped in clusters, chains and groove-like chains, mostly peripheral and approximately radial to Nectarian basins. *Interpretation:* Secondary impact craters of Nectarian basins.
- **Nnj** — **Nectarian Nectaris Janssen Formation** - Rolling subdued terrain having numerous linear features including ridges, scarps, and grooves radial to Nectaris basin. *Interpretation:* Nectaris basin ejecta equivalent to, but more degraded than, units Iif, Iohi, and Ioho.
- **Np** — **Nectarian Plains** - Generally flat, moderate albedo terrain with dense population of large, old craters. *Interpretation:* Ambiguous origin, possible ejecta from large impacts and basin forming events.
- **Nt** — **Nectarian Terra** - Moderately rough surface, rolling to moderately rugged overall relief, with diverse ages of superposed and buried craters. *Interpretation:* Complex mixture of local erosional debris and crater and basin ejecta; megaregolith.
- **Ntp** — **Nectarian Terra-Mantling and Plains** - Light colored, wavy or rolling surfaces more heavily cratered than unit Ip. *Interpretation:* Primary and secondary ejecta of Nectarian basins and large craters equivalent to units Ioho and Ip, with more erosional degradation.
- **pNb** — **pre-Nectarian Basin** - Subdued, eroded mountain rings and arcuate segments of rings, rim, walls, and inner-ring materials. *Interpretation:* Erosionally degraded impact related structures and ejecta materials.
- **pNbm** — **pre-Nectarian Basin Massif** - Large mountainous landforms commonly lying along arc, both continuous and discontinuous, gradational with generally finer-scale topography. *Interpretation:* Uplifted bedrock during the formation of basins.
- **pNc** — **pre-Nectarian Crater** - Discontinuous, subdued rim crests and rounded, curved or straight rim remnants. *Interpretation:* erosionally degraded morphology and material from a primary impact event.
- **pNt** — **pre-Nectarian Terra** - Rugged, diverse terrain, degraded partial crater rims, gradational with smoother unit Nt, and rougher units pNbm and pNc. *Interpretation:* Complex mixture of local erosional debris and crater and basin ejecta; megaregolith.

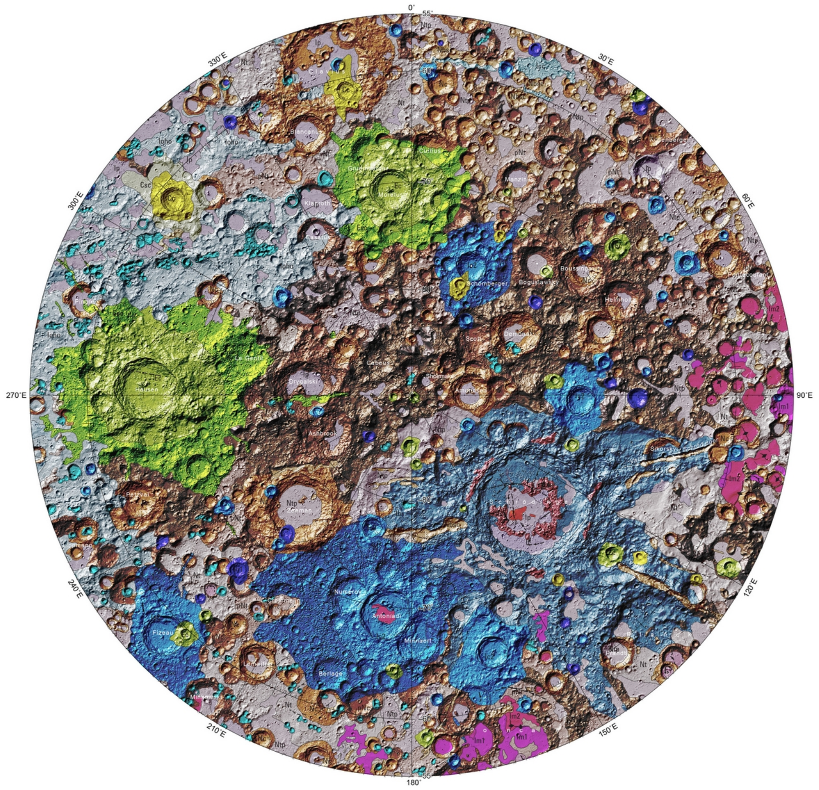
Volcanic channel (rille)
Crest of buried crater rim
Crest of crater rim (hachures point inside crater)
Graben axis (dashed where approximate)
Lineament (ambiguous origins)
Wrinkle ridge crest (dashed where approximate)



SCALE 1:6 078 683 (1 mm = 6.078683 km) AT 90° LATITUDE
POLAR STEREOGRAPHIC PROJECTION

1000 500 0 500 1000 KILOMETERS

NORTH POLAR REGION



SCALE 1:6 078 683 (1 mm = 6.078683 km) AT -90° LATITUDE
POLAR STEREOGRAPHIC PROJECTION

1000 500 0 500 1000 KILOMETERS

SOUTH POLAR REGION

SCALE 1:10 000 000 (1 mm = 10 km) AT 0° LATITUDE
MERCATOR PROJECTION

2000 1000 500 0 500 1000 2000 KILOMETERS

Unified Geologic Map of The Moon

C. M. Fortezzo, P. D. Spudis, and S. L. Harrel

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