**Gale Crater**


**Description of Site:** Gale Crater is a 155-km diameter, Noachian-age crater located directly on the dichotomy boundary near the equator, south of Elysium Mons. The interior contains a 5-km thick mound of material that is finely bedded and which contains a bottom stack of clay and sulfate bearing materials (Lower Fm.) which is overlain by a kilometers-thick stack of layered material with unknown origin and with a spectral signature similar to dust (Upper Fm.).

**Diverse but Understandable Geology?**
- Mineralogy appears to capture the current paradigm of the secular change in mineralogy and climate on Mars (clays → sulfates → Fe-oxides)
- Many layers; lateral continuity of layers.
- Marker bed(s).
- Can access geology of Lower Fm. with MSL.
- What is the source of sediments? This is a large stack of sediments!
- What is the origin of the mineralogy? Detrital or authigenic?
- Is this stack representative of Mars?

**Habitability?**
- Clays imply substantial water.
- Canyons in mound and alluvial fan material suggest water activity.
- Although water played a role here, the exact characteristics of the early environment are not well-constrained.
- How long-lived was the water?

**Biological/Preservation Potential?**
- Undeformed layers of clay-rich material beneficial to preserving fossils/organic material.
- Again, the environment promoting preservation is still largely unclear. Was there anything biological to preserve?
The Landing Ellipse